Politeness in Teacher–Student Dialogue in Mathematics: a Socio-Linguistic Analysis

LIZ BILLS

Why's that?

Frank is seventeen. I am sitting with him as he works through the division of $x^3 - 8$ by $x - 2$

> Frank: .... *[He writes 0 + 4x in the next line of the calculation]* ... . + 4, not + 4x. *[He crosses out the x]*
>
> Liz: Why's that?
>
> Frank: No, it is + 4x

How should we interpret this exchange? As Frank's teacher (which was one of my roles in the situation), perhaps I wanted him to reconsider for himself and to understand why his deletion of the x was ill-advised. Or perhaps I wanted information about what he was thinking, that is to know why he changed his mind. Or my main interest may have been in correcting his mistake, so that he could complete the division 'successfully' in terms of getting a correct answer. The question 'Why's that?' might be used in place of a direct correction (e.g. "No, it's $4x$") as part of a 'politeness' strategy, intended to avoid baldly telling Frank that he is wrong.

Frank's response might give us some clues about how he interpreted my intentions (though it tells us little about what my intentions were). Perhaps he interpreted the question as an invitation to reconsider and, having briefly done so, pronounced that "it is + $4x$". If he thought that I wanted to know what he was thinking, then he avoided fulfilling the request. Thirdly, he may have interpreted my question as communicating that he had made a mistake. This might be either because he recognised that a teacher's question often arises in such circumstances or because he recognised a 'politeness' strategy which is common beyond the classroom.

It is now twenty-five years since researchers noted that pupils often respond to teachers' questions by assuming that they have made a mistake (Sinclair and Coulthard, 1975). The mathematics education community has reacted to this finding by exhorting teachers to change their discourse patterns, in particular to request explanations from pupils in all circumstances, not just when a correction is required. I would like to suggest that there is more to be gained by looking at teacher–pupil dialogue in mathematics as a subset of dialogue in general, certainly with distinctive features of its own, but also influenced by general features of dialogue in the society within which it takes place.

With this point in mind, I have started exploring a theory of 'politeness' which claims to describe and explain some universal features of dialogue and considered what new insights it might give into teacher–pupil dialogue. In particular, I have used it to analyse two interviews between teacher and pupil in order to assess the implications of any new interpretations.

Pragmatics and mathematics education

Language in its widest sense and teacher–student interaction in particular are central to the enterprise of education. It is not surprising, then, to find a long-standing interest in the discipline of linguistics among education researchers. Interest in linguistics among *mathematics* education researchers is a more recent phenomenon, but is now firmly established. Trends in linguistic scholarship, away from analysis at the level of the sentence and towards discourse analysis, away from invented examples and towards naturally-occurring data, have been reflected in the most recent work within mathematics education research (e.g. Chapman (1997), Gerofsky (1996, 1999), Morgan (1996, 1998), Rowland (1999a, b)).

Chapman's work makes a linguistic characterisation of 'more mathematical' language. She claims that a shift towards such language is an integral part of mathematical learning and describes how a teacher encourages students to make such shifts. Gerofsky applies a linguistic analysis to two particular types of discourse within mathematics education, those of word problems and college lectures. Viewing each as a genre, she draws comparisons with other genres enabling a different perspective on certain taken-for-granted aspects of mathematical discourse. More precisely, she considers parables and puzzles/riddles as genres similar to word problems, and examines attempts to make word problems more directly linked to real life in this light.

Morgan looks at written language, particularly in the context of students' assessed written work, and analyses it according to Halliday's (1985) functional grammar, while Rowland takes a wide-ranging view of the role of vagueness in mathematics talk and includes some comments on politeness in teacher–student interaction. I shall refer to some of his examples of politeness strategies later in this article.

All of these studies could be classed under the heading of 'pragmatics', since each deals strongly with the context of the utterances under scrutiny. Rowland's and Morgan's books might be seen as instances of 'variation studies', looking at general linguistic features of discourse within a very particular setting. I would situate my own study in both of these categories.

Something which all these studies have in common is attention to the interpersonal aspects of the learning of mathematics: that is, they take account of human relationships in the teaching/learning process and at the same time focus on the specifically mathematical nature of the interaction. It was this dual interest that led me to consider the notion of 'politeness' in the context of teacher–student conversations in mathematics. As a linguistic term, 'politeness' was popularised by Brown and Levinson (1987) when they developed a framework to account for some apparently universal features of social interaction.

Politeness

The Brown and Levinson framework assumes that participants in a conversation are rational agents: that is, they choose means which will satisfy their ends. Each participant is endowed with what Brown and Levinson call 'face' and this takes two forms – 'negative' and 'positive' face. A person's negative face is their claim to territories, to freedom of action and freedom from imposition. A person's positive face is their need for social approval, or their wanting that their wants be considered desirable by at least some others. The theory is based on the presumption that it is in the mutual interest of participants in a conversation to maintain each other's face, as part of a strategy for maintaining their own face.

Certain communicative acts that the speaker (S) might wish to perform are inherently threatening to the hearer's (H's) face. Such 'face-threatening acts' (FTAs) can be categorised according to whether they threaten negative or positive face. The threat to face inherent in these acts can be reduced by certain strategies designed to 'give face' to the addressee. These redressive actions include positive politeness (oriented to positive face), negative politeness (oriented to negative face) and going 'off-record' by using hints and metaphors.

Brown and Levinson hypothesise that these strategies can be placed in a hierarchy as follows:

1. do FTA without redressive action;
2. do FTA on-record with positive politeness;
3. do FTA on-record with negative politeness;
4. do FTA off-record;
5. don't do the FTA.

The theory predicts that S will usually want to minimise the face threat, but will not choose a strategy less risky than necessary, for fear of suggesting to H that the threat to face is greater than it actually is. Factors determining the seriousness of an FTA, and hence the strategy needed to reduce the risk, are:

(i)   D, the social distance between S and H;

(ii) P, the relative power of S over H;

(iii) R, the ranking of the imposition of the FTA.

All of these factors are as perceived by S to be understood by H. Greater social distance and ranking of the imposition

tend to increase risk, whereas relative power of S over H reduces it.

Brown and Levinson's claim, supported by a catalogue of examples from three different languages, is that this framework describes some universals in language use, spanning both different languages and different cultures.

The politeness framework should be understood against the background of two general principles of linguistic theory. The first, due to Grice (1975), is the *co-operative principle*:

> Make your contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged. (p 45)

This principle is an assumption underlying efficient, co-operative use of language. Grice shows how hearers re-interpret apparent violations of this principle on the assumption that at a deeper level the communication is still co-operative. The co-operative principle is expanded by Grice into four Maxims, those of Quality, Quantity, Relevance and Manner.

The following example is due to Levinson (1983, p 102):

A: Where's Bill?

B: There's a yellow VW outside Sue's house.

B's response, although apparently irrelevant to the question asked, if assumed to be co-operative, in particular if assumed to be relevant, suggests that Bill may be at Sue's house. Note that the co-operative principle assumes an intention on the part of speaker and hearer to co-operate in pursuit of communication, but not necessarily to any other end. It does not assume that partners in conversation have common goals. It is this assumption of co-operation between speaker and hearer that allows speakers to use 'off-record' strategies to communicate their intentions whilst still being 'polite'. In other words, a 'hint' can be understood by a hearer if they assume that an apparently irrelevant remark (such as B's remark above) should be understood as relevant. Gerofsky (1996) also includes some discussion of this aspect of Grice's work, in particular the Maxim of Quality and its relevance to mathematics word problems.

The second principle is a way of understanding meaning and intention in the context of an analysis of dialogue. A naive view of meaning attributes it to the words spoken and identifies it with the speaker's communicative intention. A more satisfactory framework must take account of contextual and background information relevant to the utterance. It must also distinguish between speaker's meaning and hearer's meaning: that is, between what the speaker intends to convey and what the hearer concludes that the speaker intended to convey. In my analysis of transcripts, I have not been able to make any definitive statements about speaker's or hearer's meaning, but have considered a range of possibilities, many of them suggested by the politeness framework.

Since it was first proposed in 1978, the politeness framework has been applied to a variety of communicative situations and sub-cultures. The teaching situation is more than usually dependent on verbal communication.

Teachers use language for 'telling', but also for managing interpersonal relations in a way that must take account of the 'face' needs of the students

Cazden (1979) points out that teachers, by the nature of their professional role, are continually posing threats to students' face. These threats take the form of constraints on students' freedom of action, evaluations of their actions and utterances and interruptions of student work and talk

First, constraints on freedom of action are clearly threats to students' negative face Rowland (1999b, p 172) analyses part of a conversation between a primary school teacher (Hazel) and two pupils in her class along these lines, showing how she uses conventionally polite indirect speech acts to reduce the threat to the pupils' negative face. This takes the form of orders presented as questions, for example: 'Shall we try it out and see what happens?', and also of 'hedges' (one form of expression of vagueness), as in 'Can you *sort of* explain the pattern for me?'.

Secondly, evaluations of pupils' utterances and actions, especially negative evaluations, constitute threats to positive face since they express approval or otherwise Interruptions constitute threat to both positive and negative face, since they are an expression of authority and of approval or disapproval Cazden goes on to examine teachers' strategies for controlling student behaviour in terms of politeness

She emphasises the contrast between negative and positive politeness strategies and their relation to social distance between teacher and students Social distance (D), as one of the three factors which contribute to the seriousness of an FTA, and relative power (P) are largely constant for any particular teacher-student pairing, whilst the ranking of the imposition (R) is variable. Cazden particularly considered social distance as influenced by the cultural background of teacher and student and its impact on the politeness strategies used.

My concern in this article is not so much with control of student behaviour as with the way in which the teacher's utterances present and reflect the relationships among teacher, student and mathematics. My analysis focuses on the teacher's use of the five strategies listed above for dealing with FTAs and through this analysis several aspects of the relationship become visible

About the interviews
My data for this study consist of transcripts of interviews with two seventeen-year-old students, both boys, who were at the end of their first year of study for A-level mathematics (the national school-leaving exam at age eighteen for England and Wales) I have called the students Eddie (E) and Frank (F) and identify myself as Teacher (T). I had been with them for almost all of their pure mathematics lessons (three hours per week) during the school year, either as their teacher or as a participant-observer.

My main purpose in working with them for the year and in making the interviews was to probe their understanding of generality and the move from particular to general. My analysis of the interviews from this perspective is given elsewhere (Bills, 1997). I chose to re-analyse the interviews from the point of view of 'politeness' when I became interested in what this theory might have to say about teacher–pupil interaction in mathematics

As their teacher, I was also concerned that they should have a productive learning experience and was sensitive to them as known individuals in a way which an unknown interviewer might not be. Some of the tension which exists between the two roles of teacher and researcher has been discussed by Ainley (1999) My role in these interviews felt very much like her description of the *teacher's* (rather than the researcher's) perspective on intervention.

> As a *teacher*, I want to lead children forward, to present new opportunities, and to try to get children to take notice of them. I get led into questioning and telling I want children to succeed, so I may go on until I am happy that they have (p. 45)

I had prepared a bank of tasks, mostly on co-ordinate geometry, from which the students and I made a selection. I asked the students to work through the problems and talk to me about what they were doing, which both did very effectively.

Neither student had been very successful in their studies. Eddie had just repeated the lower-sixth year (the first year of post-compulsory schooling) in mathematics because he had failed the modular examination the previous summer Frank had just decided to drop mathematics as an A-level subject. (The school policy was that all lower-sixth students should study four subjects at A level in the lower sixth Most would then drop one of their four subjects to concentrate on three A levels in their final school year.) Eddie's interview took place shortly before he took the summer exam in pure mathematics, whilst Frank's took place shortly after it. Both volunteered to be interviewed and knew that the interviews were in confidence. Both students needed a significant amount of help in working through each of the tasks they attempted.

The interviews were conducted in a quiet room within the school and in private, outside of mathematics lessons but within the normal school day I was speaking to the students as their teacher, but without the influence of the rest of the class. Thus, my situation in the interviews differed from the normal classroom situation in two important ways First, I was able to devote all of my attention to one student and, second, I did not have to concern myself with how my utterances would influence other members of the class in their opinion of the individual student or of me. Similarly, the students did not need to concern themselves with their appearance to their peers but may have felt inhibited by the presence of the tape recorder.

The interviews lasted about forty-five minutes. In the transcripts, a series of dots represents a pause of half a second per dot.

The teacher's politeness strategies
I have analysed the transcripts as though in the third person, talking about 'the teacher' rather than about myself and drawing only those inferences that can be made from the text and from factual information about the situation The first reason for this is pragmatic Four years have elapsed between making the tape recordings and writing this analysis. My memory of my intentions and reactions is certainly unreliable. The second reason is that I am treating the pair of transcripts as an example of a text to be analysed, the main

point being to show how new insights might be gained from such an analysis rather than to draw conclusions about these two conversations in particular.

My analysis examines the teacher's contribution to the two conversations by looking at each occasion on which it is clear that an FTA is being performed by the teacher, either on- or off-record. It is not possible to analyse the occasions on which an FTA is considered but not performed. I describe the kinds of FTAs performed and discuss the redressive strategies which are used.

Types of FTAs

I have identified altogether 46 FTAs performed by the teacher in the two interviews, 25 with Frank and 21 with Eddie. The vast majority of these (37 in all) were occasions where the teacher wanted to 'correct' something that the student had written or said or seemed to be thinking. Each is a clear threat to the student's positive face, since it involves a negative evaluation of the student's efforts, and is a form of contradiction. Six of the remaining nine FTAs were instructions, either to start work on a particular problem or to use some strategy in solving it. These instructions represent a threat to negative face since they threaten the student's freedom of action. The remaining three FTAs which I have identified are two (genuine) requests for explanation and one offer of help.

I have classed the requests for explanation as FTAs because they could be interpreted by the student as indirect corrections or as indirect criticisms of the explanation already offered, either of which might threaten the student's positive face. The offer of help is classed as an FTA because it threatens negative face by suggesting that the hearer may incur a debt to the speaker, and threatens positive face by implying that the hearer is in need of help.

This distribution of types of FTAs is clearly dependent on the kind of interaction taking place. In a one-to-one conversation with a sixth-form student, it is not surprising to find few instructions and no reprimands. The novice–expert relationship between teacher and student makes the predominance of 'corrections' unsurprising. The types and extent of redressive action taken by the teacher tell us something about how the teacher hoped to construct this relationship.

Redressive Strategies

Off-record FTAs. Short of deciding against doing the FTA because the risk is too great, this is the safest strategy identified by Brown and Levinson. Amongst the numerous ways of going off-record that they list are giving hints and clues, under- and over-stating, being ironic and using rhetorical questions. Each of these ways relies on the hearer to make a conversational implicature, that is to draw a conclusion about the speaker's intention from an assumption that their contribution was intended to be co-operative in the sense of Grice described earlier. It therefore leaves open the possibility that the speaker could claim that that was not what they meant and hence reduces the face threat.

Both transcripts contain a small number of examples of

'hints' from the teacher as to what the student should do next:

E: the gradient of that would be $2x$ as well . . so that would be where $b = 2ax$ .. 'cause $2x$ would be the gradient, which would be m times x as the other co-ordinate is (0, 0), so that would be $b = 2ax$

T: Uhmhm . . . . You were thinking about replacing that x with an a a minute ago .

or that something has gone wrong:

F: I think umm, $-x^2$ yes?

T: Umm, you're subtracting the bottom line from the top line ...

A much more common off-record strategy in these transcripts is to ask a question rather than make a statement. This strategy was only used where the FTA was a 'correction', i.e. where the principal desired outcome was that the student should recognise a mistake. In this first example, Frank is substituting $x = -1$ into the expression $x^3 - 1$:

F: This minus take away 1 ... If I do it the other way round it would be minus, it would be 1 take away -1 *[writes 1- -1]*

T: .. . What do you mean by doing it 'the other way round'?

And here, Eddie has just arrived at expressions for a in terms of b and y and for b in terms of a and y when what he needed were expressions for x and y each in terms of a and b

E: It looks a bit messy *[laughs]*

T: What is it you've worked out?

Brown and Levinson mention questions in two contexts as politeness strategies. The first is the polite request, e.g. 'Can you pass the salt, please?'. Taken literally this is an enquiry about the hearer's ability to perform the task, but, as the tag 'please' betrays, it has become a conventional polite request. Any hearer would understand that they were being asked to pass the salt, not to state whether they were able to do so. A parallel in the classroom would be 'Shall we start with question six?'.

I have already referred to Rowland's examples of such polite requests in Hazel's transcript. Because this kind of question is conventionally understood not as a question but as a request, Brown and Levinson classify it as an on-record FTA redressed with negative politeness, rather than an off-record strategy.

The second context in which Brown and Levinson mention questions is that of the rhetorical question which they class as an off-record strategy, although their examples scarcely leave any room for alternative interpretations: 'How many times do I have to tell you .. ?' or 'Why in the world did he go and get drunk again?'.

My examples from these transcripts fall into neither of these categories, but I have classed them as off-record FTAs

because they allow interpretation as a hint that something is wrong whilst allowing the student to discover the mistake 'for themselves'

Of course, there is nothing new about suggesting that teachers frequently ask questions of their students when telling would be an alternative strategy. Much has been written about what is to be gained and lost by such action, including the observation that much is 'told' by the asking of a question, e g Ainley (1986, 1988) and Binns (1990). Teachers have been understood to ask questions in order to assess what a student knows or is thinking, in order to engage them with the activity or in order to 'start from where the student is'

What I want to draw attention to here is that this action, intended by the teacher to be heard as a literal question, may be interpreted by students as a politeness strategy. In other words, they may see the teacher's questions as an attempt to save their face whilst pointing out their mistake, rather than as any sort of pedagogic strategy.

Brown and Levinson (1987) also report work on children's acquisition of politeness strategies which suggests that children as young as two-and-a-half years of age are already using questions as instructions/requests. It certainly seems reasonable to expect seventeen-year-old students to recognise off-record politeness strategies. In the case of these teacher questions, interpretation as a politeness strategy means seeing the questions predominantly as intended to convey that the student has made a mistake. A student making this interpretation would respond to the information 'I have made a mistake' rather than to the literal content of the question. This response could take the form of looking for the mistake or may be an unthinking correction.

There is some evidence from these transcripts of students taking these questions as cues to look for a mistake:

E: Any point on the normal.

T: Any point on the ... which one do you mean by the normal?

E: Sorry, the perpendicular line, you're given the equation $x + 2y - 4 = 0$.

I: Yeah.

E: Any point on the line perpendicular to that, or the point where they intersect

and the example given earlier:

F: ... . *[He writes 0 + 4x in the next line of the calculation]* .... *+ 4, not + 4x. [He crosses out the x]*

T: Why's that?

F: No, it is + 4x.

The danger is that, having interpreted the teacher's question as a polite correction, the student will 'politely' correct it, without engaging with the reason why the correction was needed.

Critics of (what they describe as) 'traditional' teaching methods claim that this unhelpful kind of student reaction is an almost inevitable consequence of this kind of teacher question, because students recognise the question as a cue that they have made a mistake and are then only interested in making a correction. Such an explanation has the student deliberately ignoring what the teacher has asked in favour of responding to the cue the teacher has unwittingly given. An explanation which takes account of 'politeness' has the student assuming that the teacher *meant* to convey the message that a mistake had been made. The student is then co-operating with what they take to be the teacher's intention.

Remedies for this situation then depend on our view of what the students' interpretation has been. If we see the student as deliberately responding to the cue, rather than to the literal meaning of the question, then we should avoid creating the link 'teacher's question means I have got something wrong' by frequently asking for justification and explanation in all situations, not just where a mistake has been made.

There is evidence from these transcripts that the teacher was aware of this strategy. In these two examples, there is no correction involved:

E: which would be $y = M(p - \frac{q}{M}) - Mp + q$ just multiply that out so you've got $y = Mp - q - Mp + q$, so the qs cancel out, so $y =$ well, zero, 'cos they cancel out as well.

T: Uhmhm ......

E: Yeah .

T: Why have we got zero then?

and

F: m is the gradient and c is the constant ... of the

T: Yes, what do you mean by the constant?

On the other hand, if we assume that the student is co-operating with the teacher's apparent intention to cue a mistake, then there are numerous ways of altering the teacher's strategy to convey a different intention. One approach could be to separate the cue that a mistake has been made from the request for explanation: e g "I think you've made a mistake. Can you tell me what you were thinking?". Another possibility could be to turn the request for explanation into an emphatic instruction rather than a question: e g "Go back to that point and explain each step of your working to me".

Examples of other politeness strategies follow.

Positive politeness

Strategies for positive politeness are those which express approval of the hearer or approval of or concern for the hearer's wants, or convey in-group membership. Rowland (1999b, p 201) points to his own use of such a strategy to redress his FTA in pointing out to an undergraduate student that there is a gap in his argument ('OK, I mean, can you take it further from there? I mean you're absolutely right ...')

Positive strategies identified from this transcript include:

- *apologies for imposition*

    I: Um, I think I'll just ask you to do one more because you're probably getting a bit tired of this.

    E: No, I'm fine [*laughs*]

- *use of 'student language'*

    T: Well it means, um, if . you've got this line. And you've got this point

    E: Yes

    T: You draw a line from the point to the other line, um and it meets it at a right angle.

- *offering excuses for the student's difficulties*

    F: I'm just trying to work out where the axes are ...

    T: Right .   ... It's a pity you weren't in the lesson last week because we were doing a bit of this

    F: Right, right

    T: And then you would have been reminded about it.

A more widespread strategy is inclusion. This is achieved by the use of 'we' or 'us' to include speaker and hearer in the action:

    I: Let's try starting with that one.

or by use of tag questions which seek the hearer's agreement or approval:

    E: So, if that's the gradient of this one, the perpendicular gradient would be $-\frac{1}{2x}$ or $-\frac{1}{2}x$.

    I: They're not the same, are they?

The use of 'we' can have a special significance in mathematics education, making reference to a school or mathematical community, as explored by Pimm (1987) and Rowland (1999a), but its polite use here refers unproblematically to speaker and hearer

Negative politeness

Negative politeness strategies are oriented towards the hearer's need for freedom from imposition. In these transcripts, the teacher frequently uses strategies to reduce the force of an imposition:

    I: Try doing a little diagram of what the tangent at the point that we're talking about would look like and see if that helps.

or to reduce the force of a contradiction:

    T: What is it you've worked out?

    E: Er, the co-ordinates of a and b.

    I: Right, that's um, not strictly what they asked you for.

Another common strategy is to offer apparent agreement whilst making a correction:

    E: So that's what I was saying it's a straight line.

    I: Yeah – that would be a horizontal line.

    E: Yeah – a horizontal line where $y = \frac{1}{2}$ at all points.

Hesitations also play a part in making the imposition more tentative and less threatening:

    F: Take away –1 gives nothing [*writes –1 –1*].

    I: Erh, it's not take away –1.

FTAs without redressive action

Several FTAs classified as corrections are performed baldly, without any form of redressive action:

    E: .... Well, it would be about the point which is the minimum so if you differentiate $x^2 - ax$ you get $2x - x$.

    I: $2x - a$.

    E: $2x - a$ sorry .. $2x - a$ So when x is equal to 1, which will be 2, then a will equal 2 for it to be a minimum point.

and

    F: x into x is nothing

    I: 1

    F: 1

Given the very frequent, varied and fairly elaborate use of redressive action demonstrated elsewhere in the transcripts, it seems worthwhile to ask why no redressive action was taken on these occasions. One way of answering this question is to look at Brown and Levinson's criteria for choosing strategies. Of the three criteria, the ranking of imposition (R) is variable in these transcripts, whilst the other two remain constant. To interpret this in terms of these conversations, I would say that corrections are made baldly to mistakes seen by the teacher as trivial, so that there is little threat to the student's face in pointing out the mistake.

Brown and Levinson make the point that strategies less risky than necessary should not be used, because the choice of strategy reflects the speaker's estimate of the ranking of the imposition, in this case the seriousness of the mistake. If we assume that the students are familiar with these conventions of politeness, then we can see this choice of bald FTAs as a signal from teacher to student that the mistake she

is pointing out is a trivial one, to be regarded as a 'slip'

In similar way, Rowland (1999b, p 191) finds that a teacher of four-year-olds (Sue) asks questions baldly when she is confident that the pupils will be able to answer ('Right, Anna, how many people are on the floor?'), but asks them with redressive action when she thinks they will find the question challenging ('How many more people do you think we need to make ten people?').

Implications for the teacher–student relationship

My examination of the two transcripts has revealed a large number and a wide range of politeness strategies used to reduce face threat. The teacher's perception of a need to employ politeness strategies suggests that she felt that some or all of the following were true:

    (a) the social distance between herself and the students was quite large;

    (b) the power differential between speaker and hearer was not very great;

    (c) the imposition of at least some of the FTAs performed was substantial

Social distance created by age difference and institutional setting was a strong feature of this situation, as is confirmed by the comparative lack of positive politeness strategies emphasising in-group membership. The differences in imposition of various FTAs has already been offered as a reason for distinguishing strategies. My suggestion is that a major influence on the teacher in her widespread use of politeness strategies was her wish to downgrade the apparent power relationship between teacher and student.

Bishop (1988) identifies two forms of a teacher's power, *formal* and *sapiential*. Formal power is that endowed by the general culture, whilst sapiential power is due to the teacher's greater knowledge of the mathematical culture The teacher's formal power was in no sense under threat in these one-to-one interviews with volunteer students. Her politeness strategies, I suggest, aimed to reduce the appearance of sapiential power by giving weight to the students' opinions, wishes and cognitive concerns.

My analysis of FTAs in these transcripts has been confined to the utterances of the teacher. In this very asymmetrical relationship, there are few occasions when the students' utterances could be interpreted as FTAs. Rowland's (1999b, pp. 198-205) analysis of his own conversation with an undergraduate student reveals a more even balance of politeness strategies

Finally, the notion of 'correction', which I have so far used without discussion, needs to be explored. The teacher's intention, in noticing a mistake in the student's work, is not simply to correct the student's working, but, much more importantly, to enable the student to construct a more sophisticated or reliable understanding of the concepts under scrutiny. This intention may lead the teacher to ask a question rather than making a bald correction.

I set this explanation of the teacher's use of questions in this context alongside the alternative view of these questions as a politeness strategy, not in order to decide which is the more appropriate view, but in order to consider them as possible student interpretations of the teacher's intentions. A teacher's question, designed to ask a student to think again about an aspect of their working, may be interpreted simply as a polite indication that a mistake has been made. If we take this view of a student's response to the teacher's question, then we may be led to different strategies for avoiding this response than have been suggested in the past

Conclusion

This analysis of one teacher in conversation with two pupils has aimed to be indicative of some of the different perspectives on teacher–student interaction which might be achieved by using a politeness framework.

First, the extent and the type of politeness strategies used can indicate, to participants as well as observers, and perhaps to a certain extent construct the social distance and power relations between participants and the imposition of an FTA Second, some strategies, here questioning, may be construed differently by speaker and hearer as a result of interpretation as a politeness strategy Third, bald rather than polite corrections may ironically be more considerate of students' face wants by implying that the mistake was trivial.

Each of these suggestions needs to be followed up by examining classroom rather than interview situations, by seeking the perspectives of participants and by examining differences between teachers and between students, especially students of different ages.

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