

80. to zero. For the real column of course the curve is not like this. It is like this (obviously visual not linguistic) So you can write that we are not interested trivial solution ( 8 second pause )
85. For writing on the board  
If C is not equal to zero then we have to take Sin of KL equal to zero. If Sin of KL is equal to zero ( ZLF is it ). ( self query). If Sin
90. of KL is equal then KL is equal to what MPI Where M is an interior alright?
93. Zero times one times two times three times What PI? Out of this also now
95. We have to choose
96. our solution .

45. then you get zero is equal to  $C \sin KL$ . Now this brings two conditions either  $C$  is equal to zero. We must discuss each one of
50. these conditions is separately ( five seconds while black-board is cleaned ), If  $C$  is equal to zero what happens? If  $C$  is equal to zero  $Y$  is zero throughout.
55.  $Y$  is zero throughout means what? ( He realizes that . confusion has been caused and he is checking comprehension now.)  $Y$  as a function of  $X$  is zero through the means this gives the shape of the column just
60. before buckling. This gives a trivial case what is trivial case? This case has not to be
62. ( Commentary on his use of the word trivial notion equal warning) the trivial case is the shape of the column shape of the
65. column before buckling. You see the shape of the column before buckling remains straight of course only in the idealized case when the column is absolutely straight perfectly straight and the load is perfectly centered .
70. then What happens is the column remains straight up to up to the critical load This can be demonstrated with the help of the help of this column load - watch this deflection card-as you
75. See this is the critical of the earlier load the deflection remains zero .  
Until the critical load is reached: so  $Y$  equal  $w$  zero here in this situation is controlled by the trivial solution  $p$  is equal

12. deflection chart.  $M_x$  is the bending over What
13. is  $M_x$ ?  $M_x$  is equal to 3 times the deflection but since  $EI$  times  $Y$
14. is causing a hogging action therefore  $M_x = -P \cdot Y$ .
15. You might ask why I took this column deflecting
16. towards the top. You should take it downwards
17. and you will still get the same answer because
18. the moment will be sagging and the deflection
19. will be negative again we will get  $-P$  into
20.  $Y$ . Now we proceed further.
21.  $EI$  into  $Y$  by  $d^2X^2$  (squared) is equal to  $-PY$ . If
22. You transpose you get  $d^2Y$  into  $Y$  by  $DX^2$  (squared)
23. Plus  $Dy$  is equal to zero. If you divide through
24. Out by  $d^2Y$   $d^2Y$  by  $Dx^2$  (squared) Plus  $P$
25. divided by  $EI$  into  $Y$  equal to Zero. This
26. differential equation you have already done
27. in your mathematics course but probably
28. not with physical concept of the idea of
29. stability of buckling. Putting  $K^2$  (squared)
31. equation as  $d^2Y$  by  $DX^2$  (squared) Plus  $K^2$  (squared)  $Y$
- equal to Zero. The solution to this equation is equal to
- $C \sin$  of  $KX$  plus  $P$  force of  $KX$ .  $C$  and being
35. integration constant can be found with help of boundary
- conditions what are the boundary Conditions?  $X$
- equal to Zero and if  $X$  is equal to zero
- $Y$  is equal to ( class responds Zero). when
40. you put this condition zero is equal? ( class responds
- Zero). This becomes zero plus  $D$ th plus  $D$  as equal to ?
- ( class responds "Zero"). Now add  $Y$  equal to  $A$ ,  $Y$  is
- again equal to zero— the deflection of the column is zero

2. The frequent use of cohesive devices such as anaphora , rhetorical questions ellipsis is the dominant feature of the lecture. This featurer is peculiar to spoken disocurse.
3. Some major differences between written and spoken discourse cause incoherence particularly when certain utterances are juxtaposed. This incoherence does really affect communication in a speaker / Listener situation.
4. Some of the performance errars which are peculiar to spoken discourse appear in different places of the lectures. The misuse of the concord between the subject and the verb, and the omsision of verb to be in various places. Examples of these errors "Conditions is and equall to Zero" .
5. The redundant use of adverbs and some other expression was intended for emphasis for attracting the students' attention.

### **Appendix A**

1. The Column is thin at two ends and has got
2. a length of A. The deflection at any point of
3. Column is represented by y at any distance x.
4. Y is taken Positive upwords and X is taken
5. Positive to the right. You already know that sagging
6. moments have been taken positive by us and hanging
7. moments negative and this convention of bending
8. Over when combined with this convention of x and
9. Y quadrants gives us a relationship which is
10.  $E I D^2 Y$  by  $EX^2=N$
11. This has already been done in the

Line "74" "watch this ". This is only used in spoken discourse when audiovisual aids are employed.

Line 74.75." "as you see" a rhetorical device to indicate effect

Line 75. "This is the critical load of the ....."

An interesting case of ellipsis where the word "point" or "state" should be inserted.

Line 81. "The curve is not like this , it is like this". A very interesting case of contrast being exemplified by the use of the same deictic rhetorical device. Obviously, the lecturer is pointing to the deflection card & therefore syntactic contrast is not necessary.

Line 83. "you can write" An example of an instruction used in spoken discourse.

Line - 89- If sin of KL is equal to Zero ——— ZLF is it?———  
if sin of KL is equal to Zero ..... ? This is an example of performance and cognitive interference when the Lecturer suddenly shows a certain amount of doubt as to whether or not he has made an acceptable statement checks this by voicing the Phrase "ZLF is it ? and by the choice of his next utterance indicates that he has rejected his doubt because he reiterates the original hypothesis.

### **Conclusion:**

A survey of the commentaries above has revealed some general Patterns which can be taken as a conclusion

1. The use of audio-visual aids like cards, diagrams on the blackboard, facial expressions and gestures has noticeably led to some major differences between spoken and written discourse. These differences appear in the use of the demonstratives and the loosely connected sentences .

- Line 61. "This case has not to been ignored".  
Anaphoric refence is created by the use of "this " to indicate "trivial" and the speaker is reinforcing the point that although the technical term "trivial" has been used, it has to be assessed technically and not in laymen's terms as not worthy of attention. The illioutionary force of this statement is to inidcate warning(1).
- Line 64. "The shape of the column shape of the column." Another case of redundancy.
- Line 65. "You see " . A feature of spoken discourse. A reader of written discourse would probably encounter "NB" or" the reader may note "etc....
- Line 67. "of course". . A cohesive device signifying that he is about to amend his previous statement.
- Line 68. "Absolutely straight perfectly straight." The second phrase acts as an emphasis. In written discourse the writer would normally juxtapose the two adverbs.
- Line 70. "Then what happens is the ...", An interesting example of a connector indicating cataphoric reference which has in it ellipsis of relative pronoun which would normally indicate that the final effect is coming.
- Line 71. "up to up to" repetition used for the purpose of emphas-  
-is.
- Line 72. "This ". An example of anaphoric reference used in both spoken and written discourse.
- Line 73. "This " is repeated but in this case it is used for cataph-  
oric reference.

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(1) See J. Searle "Speech Acts"

not normally be used in written discourse because of the supra-segmental features involved in the spoken discourse.

Line 54. An interesting case of ellipsis where the intonation is rising not falling(1). The speaker waits for the end of the clause although, in fact, it is completed.

Line 55, "Y is equal to zero throughout means what" ". Here, the speaker has realized that the previous statement has not been understood, and he now poses a rhetorical question in order to exemplify his previous statement.

Line 58/59 "Y as a function of X is zero throughout means this gives the shape of the column just before buckling". This utterance concludes the attempt to explain the previous statement but in fact because of incoherence caused by the juxtaposition of the source of confusion "throughout" with the beginning of a new clause "this gives ....." the incoherence becomes more marked.

This kind of incoherence rarely appears in printed text because it is amended by editors. What the speaker meant could probably be re-spoken as "If C is equal to zero, Y remains as a constant. This constant is given as zero because it represents the state of the column when it is under pressure but has not yet buckled. It is the state of the column just before buckling occurs".

Line 60. "what is this trivial case?"

A rhetorical question which is used for cataphoric reference because the lecturer realizes that the word "trivial" may be misinterpreted.

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(1) The Cassette is available from the authors for reference purposes.

Lines 29/30 "Putting K squared is equal to P divided by E1 gives "  
"Note the use of the participle "putting" as a commentary on the equation being written at that moment on the board at the same time as it is being spoken so-that word "gives" is equivalent to the action of marking the symbol — on the board at the end of the first part of the equation. This commentary device is peculiar to spoken discourse.

Lines 35/36 "With the help of with help of".

A typical performance error where "the" is even elided in the second repetition of the phrase.

Line 37. "What are the boundary condition ? Another rhetorical question.

Line 37. "x equal to . . . . "The word "is " is elided

Line 39. "Y is equal to zero". This is only possible in spoken discourse because the lecturer by his attention is inviting a response from the students. This response is "Zero".

Line 41. An identical response to that above is asked for by the lecturer and given by the students.

Line 42. As above,

Line 43. "Now"-discourse marker to indicate that a new step is being initiated. Not usually used in written discourse.

Line 43. "Now add X equal to zero ""'. Note that in this sample of spoken discourse ellipsis takes place. The speaker would normally say "Now add X which is equal to zero".

Line 50. "Conditions . . . .is" idiosyncratic use of the singular failing to involve concord.

Line 51-52. A rhetorical question - but note that the rhetorical question, in a sense, invites anticipation-this would



here to emphasize the logical result of "E times Y" causing a certain action.

Line .15. "you might ask why" This rhetorical device is used once again for focussing attention. It pretends to anticipate and focus on a potential problem which the lecturer indicates and he is about to answer.

Lines 16,17,19,20. In lines 16 & 17 the lecturer addresses the students body as "you" but shortly afterwards he uses the inclusive personal pronoun " we" in lines 19 & 20 as an unconscious effort to creat group solidarity. This pronominal shift was not found by the researchers in written scientific discourse from samples of six current mechanical engineering text-books.(1)

Line .20. "Now we proceed further. "This cohesive device "now" signifies a formal spoken discourse bounduny marker that one section of discourse has ended and another part is about to begin.

Lines 21, 22, 23 "If you transpose" once again we see the personal pronoun being used with active voice as opposed to written discourse conditional "If this is transposed" where the passive voice is used.

Line 25-29 "This differential equation, you have already done" "This is an example of the lecturer standing back from the lecture itself and providing a commentary on the equation that has been doing in class, pointing out the special futures of this equation which the class have done in their mathematics classes as opposed to the peculiar nature of the equation in the engineering class where physical concepts are adopted.

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(1) See *Hydroulik Machines* by Dr. Jajdish Lal,  
*Vibration Theory and Applications* by William T. Thompson  
and *Power Plant* by Dr. Manesn Varam.

## **Analysis and Commentary :**

Line-1- "has got a length of A". The use of the word "got " is common in spoken discourse, it would not usually be used in written discourse - Written discourse would usually produce "It has a length of A".

Line-4- "Y is taken positive upwards" This syntactic deviation is clear within the context of the lecture because the lecturer draws attention to the diagram on the board. Written discourse would probably state: "Y is taken as a positive co-ordinate , upwards". The lecturer has used ellipsis because his comment is accompanied by a gesture at the diagram.

Line-5- "You already know". This rhetorical device is used to reassure the learners that what the lecturer is about to say is not new and has been referred to before. This device has anaphoric function by referring back to what has been covered before and also implies a reference forward to a statement of this information written discourse would possibly state "the above mentioned or as previously mentioned."

Line .7. "moments negative" displays the same lack of an adverb.

Line .11. "This has already been done ;the deflection chart". this cohesive device of anaphora refers to work already carried with the reflection chart and refers to his previous statement concerning bending.

Lines. 12/13 "what is M"-a rhetorical question which he doesn't allow to be answered for he answers himself immediately with a definition " M is equal to .. " This is a feature peculiar to spoken discourse and is used for the purpose of focussing the student's attention.

Line .14. "Therefore" This word would not be used in written discourse as its use is redundant. It is used in spoken discourse

# **AN ANALYSIS WITH AN ACCOMPANYING COMMENTARY OF AN EXTRACT OF SOPKEN DISCOURSE IN THE FIELD OF MECHANICAL ENGINEERING**

Jassim M. Hassan  
Peter Falvey

## **The Purpose of the Paper:**

The purpose of this paper is to analyse the spoken discourse of a formal lecture to undergraduates in order to determine those features which distinguish spoken discourse when compared to written discourse. The paper pays particular attention to those feature differences to normal written discourse which are employed in order to provide for effective communication in a speaker/ listener situation.

## **Procedure:**

a lecture in "Solid Mechanics,, to third year Mechanical Engineering Students given by an Indian professor was chosen. The lecturer has recieved his M.Sc. and Ph.D from the Imperial College in London. Although the lecturers first language is not English, his command of English is perfect. Part of the lecture was taped and the lecturer was aware of being taped. The tape was transcribed (see A ppendix-A-) and later analysed. The analysis is given below together with an appropriate commentary.