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ABSTRACT

VIC is a computer program for the analysis of verbal interaction category systems, especially the Flanders interaction analysis system. The observer codes verbal behavior on coding sheets for later machine scoring. A matrix is produced by the program showing the number and percentages of times that a particular cell describes classroom behavior. Various operations can then be performed on the matrix to produce information on different groups or combinations of categories. Revisions are currently being made so that VIC can be used generally with category systems other than Flanders. (WH)

VIC: A COMPUTER ANALYSIS OF VERBAL INTERACTION CATEGORY SYSTEMS

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This article describes VIC, a computer program for analysis of verbal interaction category systems. The use of VIC with the Flanders Interaction Analysis System (FIAC) is discussed. The VIC matrix used with FIAC is explained.

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In recent years researchers have become more aware of the need to study the "interactive, process nature of speech-communication."[1] The use of verbal interaction category systems which systematically describe and evaluate language in small groups and classroom teaching situations has gained popularity.[2] Yet, analysis of verbal behavior using such systems often is a tedious and time consuming task. Most systems require that "tally marks" of observers be cast in a matrix and mathematical calculation done to arrive at generalizable conclusions.

The present paper describes VIC, a computer program for analysis of verbal interaction category systems, designed to eliminate the troublesome task of analyzing observations. An earlier paper discussed results when VIC was used with the Flanders Interaction Categories (FIAC) System to study and analyze verbal behavior in the classroom.[3] In the present paper we shall discuss VIC in more detail.

VIC, a 660 card computerized verbal interaction categories program, was developed using Programming Language One (PL/1). Although VIC was designed to handle data obtained with the FIAC System, other verbal and nonberbal systems may be used with minor modifications.[4]

An observer codes verbal behavior on coding sheets at designated intervals (e.g., every three seconds) using a specified category system. The sheets are machine scored and the information cast in a n x n matrix (where n = number of categories in the system). Information in the cells indicates the number and percentage of times that a particular cell describes classroom behavior. For example, if 200 observations are made and the cell corresponding to row 5 and column 8 contains the figures 6 and 3%, we conclude that in 6 of the 200 observations category five is followed by category 8. In terms of the FIAC System, lecturing (category 5) is followed by student talk-response (category 8) 6 out of 200 times or 3 per cent of the time.

VIC further quantifies and interprets information with relation to the matrix. Figure 1 illustrates the 10 x 10 matrix using the FIAC System. Individual areas (A,B,C, and D) and sub areas (1,2,3, and 4) are designated in the figure.

The following statements explaining information obtained from matrix areas and sub areas appear on the VIC printout:[5]

> "The "A" area shows the total number of times that pupil talk was followed by pupil talk. This happened # times in your class."
>
> "The "B" area describes the manner in which you responded to pupil talk. "B1" shows that you responded with a response # times. "B2" shows that you responded with a question # times. "B3" shows that you responded with an initiation # times. Compare these numbers and rate yourself, (teacher name)--Do you feel that you are encouraging pupil participation to the degree you deem desirable?

"The "C" area describes the manner of pupil reaction to your comments. "C1" shows that your pupils responded # times to your responses. "C2" shows that pupils responded # times to your questions. "C3" shows that pupils responded # times to your initiations."

The observations in the "D" area indicate patterns in your verbal behavior. The sub-areas: D1, D2, D3, D4, and D5 give information about your rather long statements when, and if, they exist. Extended lecture, directions, or criticizing cause the number of observations in the "D5" area to become large--you had # observations in the "D5" area. The "D1" area describes extended responses to pupil talk made by you--there were # observations of extended responses. "D2" shows that you changed your verbal behavior from initiation to response # times. "D4" shows that you changed from response to initiation # times. "D3" shows statements by you that involved the asking of questions. There were # observations of question asking behavior.

In addition to the matrix printout and statements explaining information derived from the matrix, VIC computes five indices expressing various qualities of interaction in the classroom. Tally totals of selected matrix areas can be combined and compared with the total number of observations. When used with the FIAC System, VIC computes five indices.

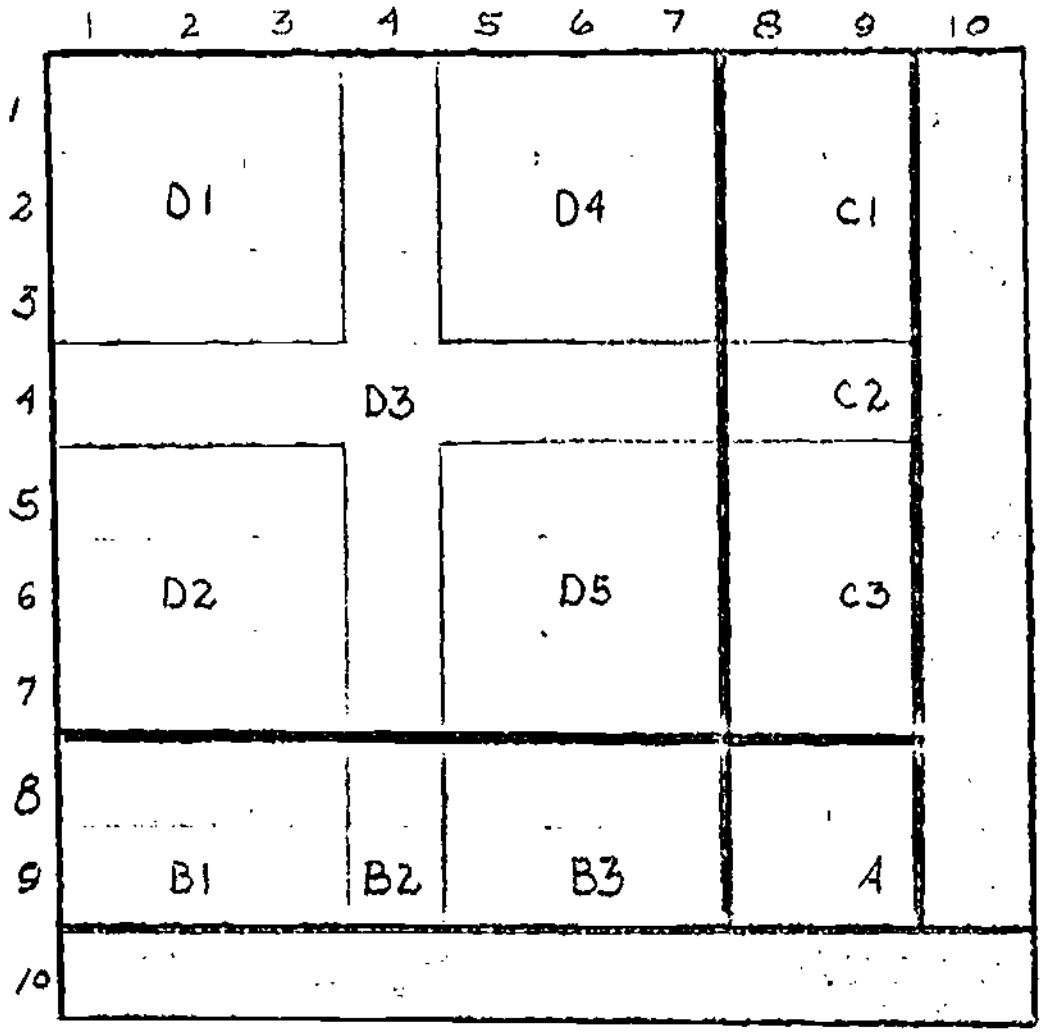
Index one, <u>the degree of student participation</u>, is calculated by summing columns eight and nine and dividing by the total number of observations. Index two, <u>the degree of teacher/student change</u>, is calculated by summing those areas which involve either the teacher

giving/granting the floor to student or a student yielding to the teacher. The B and C areas describe this condition; their sum is divided by the total number of matrix tallies to calculate Index two. Index three, the degree of teacher encouragement, compares the sums of column one, two, three, and four to the sum of columns one through seven. This ratio forms the fraction of the teacher talk which encourages student participation. Index four, the degree to which the teacher dominated the discussion, is the ratio of the total teacher talk to the total number of observations: The sum of columns four through seven is divided by the sum of columns one through ten. Index five, the degree to which teacher talk stimulated student talk, is the ratio of the tallies in the C area to the sum of columns one through seven. This is the ratio of the number of teacher-talk tallies that were followed by a student response to the total number of teacher-talk observations.[6]

VIC and its use with interaction analysis category systems is one example of how the computer can be used to aid teacher or discussant behavior. Revisions are currently being made so that VIC can be used generally with category systems other than FIAC. Also, a modification of VIC is available so that separate matrixes from several coders and/or teaching sessions can be obtained into a collective matrix. Furthermore, an option for VIC has been developed so that information from a matrix coder can be used to create a Master Matrix. Coding sheets from novice coders are compared to the Master Matrix and a third figure is printed in each cell of the novice's matrix indicating how his coding differed from that in the Master Matrix.

FIGURE 1

VIC Matrix used with FIAC System



KEY

1. accepts feeling
2. praises or encourages
3. accepts or uses ideas of students
4. asks questions
5. lecturing
6. giving directions
7. criticizing
8. student talk-response
9. student talk-initiative
10. silence or confusion

FOOTNOTES

[1]Robert J. Kibler and Larry L. Barker, eds. Conceptual Frontiers in Speech-Communication (New York: Speech Association of America, 1969), p. 35.

[2]See, for example: Leonard C. Hawes, "Development and Application of An Interview Coding System," Central States Speech Journal, 23 (Summer, 1972), 92-99; B. Audrey Fisher, "Decision Emergence: Phases in Group Decision-making," Speech Monographs, 37 (March, 1970), 53-66; Laura Crowell and Thomas M. Scheidel, "Categories for Idea Development in Discussion Groups," Journal of Social Psychology, 54 (June, 1961), 155-168.

[3]James W. Gibson and John A. Kline, "Computer Analysis of Verbal Behavior in the Classroom," The Speech Teacher, 22 (January, 1973), 58-63.

[4]For example, the center for Educational Improvement of the College of Education, University of Missouri-Columbia, uses a program similar to VIC with its "verbal interaction behavior" categories system. Work is under way now at the Speech Communication Laboratory, at the University of Missouri-Columbia, to adapt VIC to other category systems.

[5]These statements are adapted from the "verbal interaction behavior" category system referred to in footnote 4.

[6]Further information concerning VIC can be obtained from the authors.