

Is College Level Behavioral Instruction Worth The Effort And Expense?

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Graf, S.A. (1989). Paper presented in the Panel discussion Is College Level Behavioral Instruction Worth The Effort and Expense (Lawrence E. Fraley, Chair), at the meeting of the Association for Behavior Analysis, Milwaukee, May [Session #711, EDC/ELS, Room Executive B, Hyatt Regency Hotel, Saturday, May 27, 1989, Noon-1:20PM; Ernest A. Vargas, Discussant. Note: Use above reference when referring to this paper].

What's happening here?

Answer: Assess the environment.

--empirically

--periodically.

If we're going to make a decision in giving up something or getting into something, do it on the basis of data.

Once a decision is made, does it commit you to it forever?

--periodic evaluation.

Antecedent-Behavior-Consequences

Direct-Acting Contingencies

Indirect-Acting Contingencies.

Does it need to be done? (if not, then stop)

If yes, then the challenge:

Can you do it? Some things are logistically impossible or aversive.

Data, when periodically assess environment.

Does it still need to be done?

Maybe you have met the challenge, and it does not need to be done.

Do you want to do it?

Ask as you re-assess.

(This is Graf's answer).

Examples:

If you're going to do something and try it, plan ahead. Plan on recording data.

Standard celeration chart, two quarters, students, tried task twice.

Counted:

Attempts
Successes
Failures

Do you continue to do the task 7 times? No, 5 attempts. Early on, higher number of failures--decelerates in a linear function.

Is it worth the effort? No, if can't do it by 5 weeks, flush out those students who can't master the task.

Over successive calendar years, what data?

(This is looking backwards, not planning ahead).

On standard celeration yearly chart:

How many enroll?
How many withdraw?
How many "A's"

Result: Each of the grade distributions is independent.

Celerations of "A's" and "B's" do not necessarily coincide.

What answers you come up with depends on what you SEE.

Instructional Improvement -- ratings

Presented Standard celeration charts of student ratings of instruction.

Behavioral Instruction Worth The Effort and Expense (Lawrence E. Fraley, Discussion comments by Dr. Ernest A. Vargas. Behavior Analysis, Milwaukee, May [Session #711, EDC/ELS, Room Executive B, Hyatt Regency One thing that came across in the panel discussion is that innovation is a hazardous and rewarding enterprise. [referring to this paper].

More people should have attended this session. Why? Two reasons.

What's happening here?

We tend to be too formalistic about instructional systems.
We don't take into account the complexity of the system.

Graf focused on teacher's behavior--necessary element in improving teacher's behavior.

Notes taken by J.W. Eshleman, Saturday, May 27, 1989. forever?
Recopied 5/30/89. medic evaluation.

Antecedent-Behavior-Consequences
Direct-Acting Contingencies
Indirect-Acting Contingencies.

Does it need to be done? (if not, then stop)

If yes, then the challenge:

Can you do it? Some things are logistically impossible or eversive.

Data, when periodically assesses environment.

Subj: Graf '89 on College-level Behavioral Instruction (ABA presentation notes)
 Date: Tuesday, September 14, 2004 1:03:59 PM
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Is College Level Behavioral Instruction
 Worth the Effort and Expense?

Stephen A. Graf, Ph.D.

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Presented at ABA, Milwaukee, May 1989

(Notes taken by JE. See reference at end of notes.)

 About College Level Behavioral Instruction...

Graf asks:

1. What's happening here?

Answer: Assess the environment

- empirically
- periodically.

If we're going to make a decision about giving up something or getting into something, we should do it on the basis of data.

Next, once a decision is made, does it commit you to it forever?

- conduct periodic evaluations.

Also look at: Antecedent-Behavior-Consequences:

- Direct-Acting Contingencies
- Indirect-Acting Contingencies

2. Does it (e.g., particular teaching tactic) need to be done?

- If not, then stop.
- If yes, then the challenge:

3. Can you do it?

- Some things are logistically impossible or aversive.
- Data, when periodically assess environment.

4. Does it still need to be done?

- Maybe you have met the challenge, and it does not need to be done.

5. Do you want to do it?

- Ask as you re-assess.

(This is Graf's answer to the question posed to the panel.)

Graf continues:

Examples:

If you're going to do something and try it, plan ahead.

Plan on recording data:

- Data charted on Standard Celeration Charts.
- Data recorded for two academic quarters at YSU.
- Students, tried task twice.

Counted:

- Attempts
- Successes
- Failures

Do you continue to do the task 7 times? No, 5 attempts.

Early on, there is a higher number of failures, which decelerate in a linear function.

Is it worth the effort?

- No, if they can't do it by 5 weeks, flush out those students who can't master the task.

Over successive calendar years, what are the data?

(This is looking backwards, not planning ahead.)

On standard celeration yearly chart, charted:

1. How many enroll?
2. How many withdraw?
3. How many A's? Etc.

Result:

EACH of the grad distributions is INDEPENDENT.

Celerations of "A's" and "B's" do not necessarily coincide. They are independent.

What answers you come up with depends on what you SEE.

Instructional Improvement -- ratings

(Graf presented standard celeration charts of student ratings of instruction.)

Discussion Comments by Dr. Ernest A. Vargas:

"One thing that came across in the panel discussion is that innovation is a hazardous and rewarding enterprise."

"More people should have attended this session. Why? Two reasons:

1. We tend to be too formalistic about instructional systems.
2. We don't take into account the complexity of the system."

"Graf focused on teacher's behavior, a necessary element in improving teachers behavior."

Reference:

Graf, S.A. (1989). Presentation in the Panel Discussion Is College Level Behavioral Instruction Worth the Effort and Expense? (Lawrence E. Fraley, Chairperson), held at the meeting of the Association for Behavior Analysis, Milwaukee, May. [Session #711, EDC/ELS, Room Executive B, Hyatt Regency Hotel, Saturday, May 27, 1989, Noon-1:20 PM. E.A. Vargas, Discussant.]

2004 Comment by JE: Graf shared at this panel that the different grades are INDEPENDENT of each other; that A's, B's, C's, etc. celerate independently. You can see the independence when you chart grades on SCC's. Also, when answering any such question like the one posed to the panel, always ask what the data are.

Notes taken by J.W. Eshleman, Saturday, May 27, 1989
Recopied 5/30/1989.
Recopied and edited 9/14/2004.

filename: Graf89PanelTalk.txt

Comments?

-- JE

Fellow Panel Members,

The following are some thoughts regarding our ABA panel discussion: Is College-Level Behavioral Instruction Worth the Time and Expense? Lets try to get together briefly on Thursday or Friday for reaction and sharing.

Here are some of my ideas:

If we focus on considerations such as student learning, the goals of higher education, or the benefits to society of a well educated workforce, behavioral instruction is clearly worth the time and expense it requires. If, however, we focus on the efficiency of human resource development and the cost in time and effort to instructors, behavioral instruction is of doubtful advantage. In my opinion, this conclusion is supported by the lamentable but well known observation that behavioral instruction is not widely employed even by those who are familiar with it.

The use of instructional technologies such as PSI or PT engenders costs beyond those which are associated with traditional instruction. The additional costs takes the form of added time, inconvenience, and additional resources. They are experienced by the educational institution, by the student and by the instructor:

Institutional Costs

Traditionally arranged instruction in higher education is priced to the student on a credit hour basis. Except for full-time students (who receive a quantity discount), the more hours taken, the greater the charge to the student. As is the case with most services, the pricing system allocates the higher cost of providing more service to those who use more service.

The type and quality of the service rendered traditionally has been that which would be beneficial to an appropriately equipped learner, i.e., one who has the minimum aptitude, motivation, and entry level skill necessary for college. Since not all learners would be expected to benefit from such instruction, a reasonable effort has been made to appraise student readiness for college and to assure that instruction meeting certain professional quality standards is rendered. Beyond these minimums, the quality of college teaching has been governed by the principle of caveat emptor.

Traditional teaching methods permit instructors either to move students along through the educational system by assigning them a passing grade or to halt their progress by assigning a failing one. While not always educationally advantageous, such a system does control institutional expenditures on a given student as well as define the point

at which the student may need to purchase additional instruction. Given that the cost of higher education is only partially defrayed by student contributions, such a system also serves to control the allocation of scarce financial resources.

By contrast, behavioral instruction is designed to render a variable amount of service producing a fixed level of benefit or at least an open-ended opportunity to derive a fixed level of benefit. It does not charge the greater cost of additional service to the individuals who are actually using the service, it leaves the institution and the instructor liable for what are theoretically open ended costs, and it tends to allocate the greatest amount of service to those individuals who are least able to benefit from it.

Surely these considerations must be considered significant departures from accepted social and educational policy. Perhaps the public and the educational establishment must be convinced that these implicit policy changes are desirable before they will support behavioral instruction.

In addition to the issues of human resource development policy, there is the relatively simple matter of additional cost. Behavioral systems of instruction cost more per credit hour than do traditional methods. The items of additional expense are well known:

1. Tutors/proctors/managers
2. Computer hardware and software
3. Dedicated workspace
4. Extended use of facilities
5. Management and supervision of instructional system operations
6. Curriculum modification and development

Many of these costs are fixed institutional costs although items such as payment for tutors and managers can be more open-ended. The costs of time and effort to the instructor however are both open-ended and almost always borne by the instructor personally.

In summary, behavioral instruction systems are burdened with direct and hidden costs beyond that associated with traditional modes of instruction. They include the institutional outlays for hardware, workspace and personnel. They include time, effort and inconvenience to the instructor occasioned by a system which promises a fixed level of benefit to the student.

Until society begins to treat higher learning more as a necessity for social and economic progress and less as a privilege for the intellectually and economically advantaged, funding adequate to the least expensive instructional

alternatives is apt to remain the norm.

Student Cost

Virtually all students want to acquire high grades, course credits and academic credentials. A lesser number want to learn, and there are even a few who want to study. Thus "non thesis" masters programs attract more students than comparable "thesis" programs. Thus programs requiring fewer credit hours attract more students than ones requiring more. Thus intellectually demanding courses such as ones in mathematics, science, foreign language and composition must be "required" as a means of insuring student enrollment.

These facts are significant issues in considering the cost of behavioral instruction to students because behavioral instruction makes study and learning absolute prerequisites to grades and course credits. Students are customers in an increasingly consumer-sensitive market. Many of them are employed part-time or full-time. They exhibit strong a preference for methods of instruction which they find convenient. Behavioral instruction not only demands an amount of study necessary for high levels of achievement, it often requires that study and performance demonstrations be carried out at a laboratory and at times other than during scheduled class meetings.

Many students find behavioral instruction to be highly satisfying -- especially the ones who succeed in learning. Others, however, find that it requires restructuring of their study habits, that it sets too high a standard, that it is insufficiently accommodating to their needs and preferences, that it inconveniently requires multiple performance sessions at a central facility or that it simply takes too much time and effort. These students usually seek the alternative of traditional instruction.

By contrast, the minority of students who express a preference for behavioral instruction seem able or willing to tolerate traditional methods. Even though these differences in student preferences are obviously affected by custom, they nevertheless impact consumer satisfaction and enrollment.

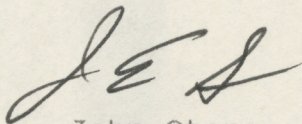
In short, behavioral instruction may be more costly to the student because it is less well suited to higher education's operative priorities than is traditional instruction. Until institutions of higher education accord a clear priority to higher education's human resource mission (priority over its customer satisfaction mission), widespread use of behavioral methods is unlikely.

Instructor Cost

Instructors who employ behavioral instruction often find themselves "swimming upstream" against a tide of methods which are cheaper, more "in tune" with the "system," and "tolerated" by a wider range of students. In addition to these disadvantages, behavioral instructors find they must devote considerable time to organizing and reorganizing curricular materials and generating performance items appropriate to the behavioral format. Much time is also spent promoting and/or defending the program to colleagues and administrators; and all of these activities take place in the context of a profession which places great emphasis on research and scholarship.

Given an educational system which takes little or no note of learning outcomes and given the myriad "headaches" which instructors are likely to encounter, the use of behavioral technology in the typical setting is more testimony to the unusual sensitivities of the instructor than the clear advantages of the technology.

Returning to the original question, is college-level behavioral instruction worth the time and expense, I would have to give a qualified answer. Over the longer term it is worthwhile to all concerned. But in the shorter term and under present conditions, it seems to offer little advantage at least to the instructors who must implement it.



John Stone
Devils Advocate

PRINCIPLES OF BEHAVIOR: CONCEPTUAL PROBLEMS

A VIEW FROM YOUNGSTOWN STATE UNIVERSITY

plastic tacks

draft

Stephen A. Graf

The objectives of this symposium as set forth by Malott and Garcia deal with problems in the study and application of the principles of behavior, which they classified as problems of terminology, problems of emphasis, and problems in interpreting behavioral data.

The framework for my remarks consists of attempts over the past 13 years to teach a general psychology course from a behavioral perspective using the Malott and Whaley text, Psychology. [As a required course for many curricula within the University, the size of a section runs between 60 and 200 people. Many other sections of this course are taught each quarter by other individuals using other texts and other perspectives.]

In Part I, the focus will be the conceptual problems at large, while Part II will focus on conceptual problems within a specific set of behavioral concepts.

PART I. General Problems.

I'd like to deal first with the problem of emphasis.

EMPHASIS 1. Student automatic with behavior principles

In what way might I best emphasize those behavioral principles which form the groundwork of behavior analysis? That seems to be a rather basic, straightforward question of emphasis, but it can easily miss a crucial feature of the teaching situation. In whose acts am I most interested, my own or my students?

Any emphasis that I choose in presenting information represents part of my teacher behavior. Fine. But the real outcome of crucial interest? Student behavior. We know that acts are related to their outcomes and so "teacher telling" isn't going to prove very effective in producing "student behaving". Here the acts involved are the student writing or saying basic principles of behavior analysis. If I'm going to follow the law of effect, I need to provide some outcomes for the student writing or saying behavior analysis principles.

I'm not talking here about "applying" principles of behavior analysis but rather out-and-out memorization of the principles. Get those principles into the student's repertoire as "rudimentary tool skills". If they can state the concepts, then take your chances with adding "understanding" and "application".

The next issue? What does it take to demonstrate that the principles are in the repertoire? The answer is that it takes speed

and accuracy. "Automaticity" is a word some have used that describes the aim fairly well. This bothers those who have lived only in the accuracy dimension. They can't see anything deficient about being slow and accurate. The answer, simply put, is that slow isn't automatic, and if it's not automatic it's not overlearned well enough to stay within the repertoire for the long haul.

The emphasis on developing the student repertoire I've been describing was not the same as the question of what specific behavior principles should be emphasized, which I think is the type of emphasis to which Malott and Garcia were alluding. Thus a second emphasis.

EMPHASIS-2. The basic terms to understanding behavior

What do you emphasize in behavior analysis? I think it should be the terminology. The problem of terminology is one we may have underestimated. Many of the terms basic to behavior analysis are more easily misinterpreted than understood. As Ogden Lindsley has pointed out, an important word in any science should "compel" the correct interpretation.

In putting together a list of terms, concepts, and their definitions, one's own behavioral history shows. I don't think one is going to develop a great list overnight or even over a year. But putting something down gives you something to work with and something "solid" for others to critique. As George Lehman says, "The road to success is always under construction."

The list, which I call the "Basic Keys" as a convenient label, currently consists of 22 items (Appendix 1). Students are required to write them accurately on two different occasions in five minutes or less. Or, an individual may opt to say them, in which case the time limit is one minute or less. There are five opportunities made available to accomplish this, and the student is done with the task as soon as two successes have occurred.

Students who succeed only once on the task receive a 'C'. Students who succeed twice but repeat the same minor flaws receive a 'B'. Students who fail to ever accomplish the task face an inevitable 'F' in the course and are advised to withdraw for the quarter and try again in subsequent quarters.

DISCOVERY: It's Tougher Than It Looks

What I have found is that the task as stated is not an automatic one. Data from the number of failures each week show a linear dividing decay function each quarter, but suggest that the number of opportunities would need to be tripled to eliminate failures.

The point that I'd like to make is that in the above situation where we're just going for building the basic definitions into the repertoire of a student, it doesn't get done with some students in the five weeks of a ten-week quarter in which we have allocated to this task. [A large amount of attention has been given to task analysis in attempts to produce more efficient student learning, but no major improvement has been produced. The next directed effort will

probably be to build computer-assisted practice through an authoring program. Logistic stumbling blocks currently exist for this project, but it may be the best answer.]

If it takes this amount of instructional effort via heavy consequence to produce a minimal feat such as reproduction of the basic behavioral terminology, how difficult will it be to produce appropriate identification of examples and nonexamples? Direct Instruction and Engelmann and Carnine's Theory of Instruction provide a technology to do this, but this type of development is still in its infancy in my course.

[I'm not sure that Direct Instruction can be done effectively in the large section settings that predominate in general psychology. If you want to ensure that the discriminations are within each student's repertoire, some type of computer-assisted drill and practice seems the best bet.]

PROBLEMS OF INTERPRETING BEHAVIORAL DATA

Problems in interpreting behavioral data represent the third focus proposed by Malott and Garcia. I think the gaps here are considerable. For example, we tend to transform or bypass frequency measures as the basic datum of our science, even though frequency and celeration measures are universal measures of behavior. We tend to create idiosyncratic, stretch-to-fill, laminated charts instead of communicating more efficiently with standard ones. We tend to cling to the belief that behaviors grow, decay, bounce and spread by adding when the evidence indicates that the world multiplies. The underpinnings of "reinforcement theory" are inadequate in handling phenomena such as counter-jumps and counter-turns, where a consequence produces a significant immediate increase in rate of response, but also a significant downward trend in rate. Malott and Garcia's addition of "analogues" is a distinct improvement, but only if the rest of us recognize its importance. To sum up, Malott and Garcia have called for a discussion of the major conceptual gaps in behavior analysis. I started out to speak to that issue, since the "Basic Keys" are an attempt to provide a conceptual framework. What I wound up saying was that we probably need to address the technology gaps in teaching. Otherwise the conceptual gaps become "academic".

Part II. Zooming in to Specific Case

Help Me Find the Conceptual Gaps

1. Psychology - studies inner & outer acts
[emphasizes radical behaviorism position; inner acts = thinking, etc.
= private events; acts = action = behavior = responses]
2. Determinism - assumes act has cause
[attitude of science from Whaley and Surratt; also from Malott & Whaley]
3. Frequency - counts act over time
[basic measure of behavior from Skinner]
4. Celeration - draws trend of frequency over time
[basic measure of change in behavior from Lindsley]
5. Contingency - hooks up act to result
[core concept from Whaley, Malott, & Garcia; might drop "up"]
6. Analysis - finds contingency
[with application (#10), the two main parts of psychology (Malott & Whaley)]
7. Rule - describes contingency & setting
[from Malott & Whaley; basis for rule-governed behavior]

- [from Malott & Whaley; replaces discriminative stimulus; includes reward contingencies, relief contingencies, punishment contingencies, penalty contingencies from Lindsley & Whaley, Malott & Garcia]
9. Analogue - bridges act & delayed result
 [from Whaley, Malott & Garcia; a key to upgrading examples to reality; cornerstone that ties into rules, direct-acting contingencies and indirect-acting contingencies]
10. Application - controls conditions to produce acts
 [with analysis (#6), the two main parts of psychology (Malott & Whaley); also corresponds to "scientific manipulation", from Whaley & Surratt]
11. Behavior mod - provides new results for old acts
 [applied field of behavior analysis]
12. Feedback - provides info about prior act
 [from Malott & Whaley; shows how result cues subsequent act]
13. Reward - accelerates act when presented contingently
 [from Lindsley; replaces "reinforcement"]
14. Relief - accelerates act when removed contingently
 [from Lindsley; replaces "negative reinforcement"]
15. Punisher - decelerates act when presented contingently
 [from Lindsley; replaces "positive punishment"]
16. Penalty - decelerates act when removed contingently
 [from Lindsley; replaces "negative punishment"]
17. Empiricism - tries looking over guessing
 [attitude of science from Whaley & Surratt]
18. Parsimony - tries simplest ways first
 [attitude of science from Whaley & Surratt; also from Malott & Whaley]
19. Remediation - tries again if wrong or slow
 [learning principle; source unknown]
20. Purposivism trap - says future produces present acts
 [from Malott & Whaley; also from Malott, Tillema & Glenn; definition more appropriately teleology]
21. Reification trap - makes abstraction concrete
 [from Malott & Whaley; multitude of examples from mainstream psychology]
22. Rationalization trap - rewards faulty thinking
 [from Malott & Whaley; "traps" used on #20, #21, #22 to emphasize common inappropriate operations]

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List of
THE BASIC KEYS
TO UNDERSTANDING BEHAVIOR

CORRECT SPELLING AND PRONUNCIATION IMPORTANT

1. Psychology - studies inner & outer acts
2. Determinism - assumes act has cause
3. Frequency - counts act over time
4. Celeration - draws trend of frequency over time

5. Contingency - hooks up act to result
6. Analysis - finds contingency
7. Rule - describes contingency & setting
8. Cue - signals contingency
9. Analogue - bridges act & delayed result

- 10 Application - controls conditions to produce acts
11. Behavior mod - provides new results for old acts
12. Feedback - provides info about prior act

13. Reward - accelerates act when presented contingently
14. Relief - accelerates act when removed contingently
15. Punisher - decelerates act when presented contingently
16. Penalty - decelerates act when removed contingently

17. Empiricism - tries looking over guessing
18. Parsimony - tries simplest ways first
19. Remediation - tries again if wrong or slow

20. Purposivism trap - says future produces present acts
21. Reification trap - makes abstraction concrete
22. Rationalization trap - rewards faulty thinking

Ditto marks may be used if lined up appropriately under words duplicated
Two ditto marks (") are used for each duplicated word

THERE ARE FIVE OPPORTUNITIES TO ACHIEVE TWO "BASIC KEY" SUCCESSES

1. 31 Mar 2. 7 Apr 3. 14 Apr 4. 21 Apr 5. 28 Apr

MAKING THE GRADE

- A: 2 bullseyes, or 1 bullseye & 1 close, or 1 close & 1 close remediated
B: 2 closes, 3 closes, 4 closes, 5 closes (not remediated)
C: 1 bullseye, or 1 close
F: 0 bullseyes, 0 closes

Contingency Managing 150 General Psychology Students

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Task analysis of the course

What constitutes "success"?

Who should achieve it?

How can I best make it happen?

Daily Chart Shares

Background	In the use of this text's preliminary version in a Standard Celeration Charting class in the Spring of 2002, a daily component involved a Chart Share done by each student. The course had been structured to meet the requirements for an "oral intensive" credit towards the General Education Requirements of the university.
Setting	Of the eight students enrolled, seven had some previous experience in Standard Celeration Charting, but one had no experience whatsoever. None of the students had used an overhead projector previously.
Materials	Materials included: <ul style="list-style-type: none">• a screen• overhead transparency projector• one or more SC charts on transparencies• a "script" for each student
Basic setup	Students initially practiced and learned how to: <ul style="list-style-type: none">• turn projector on and off• position projector image on screen• orient transparency correctly on screen• focus projector for clearest image
Procedure	Steve gave each student a chart transparency soon after the start of the class session that the students had not seen before. At first, all students used the same transparency, but soon each student would receive a different one. Initially, all basic and advanced charting features were already present on the transparency. As the students were exposed to concepts within the text, they had opportunities to add that feature to the charted data, or in other cases, measure it.
Scripts	The first scripts contained everything the student needed to say. Gradually they needed to fill in missing information when they had reached the point in this text that covered that topic. Samples of these scripts follow.
