

1974

The Effects of Stimulants on the Pulse Rate

Darrell Young

Follow this and additional works at: <https://scholarworks.uni.edu/istj>



Part of the [Science and Mathematics Education Commons](#)

Let us know how access to this document benefits you

Copyright © Copyright 1974 by the Iowa Academy of Science

Recommended Citation

Young, Darrell (1974) "The Effects of Stimulants on the Pulse Rate," *Iowa Science Teachers Journal*: Vol. 11 : No. 1 , Article 4.

Available at: <https://scholarworks.uni.edu/istj/vol11/iss1/4>

This Article is brought to you for free and open access by the Iowa Academy of Science at UNI ScholarWorks. It has been accepted for inclusion in Iowa Science Teachers Journal by an authorized editor of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

I have had nothing but enthusiastic cooperation from all persons that I have asked for help and I have the feeling that this attitude permeates our entire Section. I'm looking forward to another successful year for our Section.

Ken Frazier

BIOLOGY—ITS PEOPLE AND ITS PAPERS

Howard B. Baumel, Staten Island Community College, Staten Island Community College, Staten Island, New York and J. Joel Berger, Richmond College, Staten Island, New York

This new NSTA book is tailored to students! It includes 39 landmark papers in biology. Teachers are encouraged to use this collection of original research papers (dating from as far back as 1577 and ranging to the present) in their classrooms. Biographical and scientific background and a series of questions challenging the student to identify problems, hypotheses, and assumptions and to analyze experimental procedures and to draw conclusions based on the data that accompany each selection. These selections capture the flavor of their eras, and a time chart reinforces this unique interdisciplinary perspective by including great names in art, literature, history, and music in addition to scientific notables.

THE EFFECTS OF STIMULANTS ON THE PULSE RATE

Darrell Young, Buffalo, New York

A recent article in Science by Maugh II (1973), dealing with the possible relationship between coffee and heart disease, inspired me to develop and execute a laboratory exercise designed to measure the effects of stimulants on the body. This exercise was, of course, designed to only measure immediate short-term effects, since long-term effects are obviously more difficult to measure.

The participating population for this exercise consisted of two sections of a freshmen level course entitled "Contemporary Topics in Science," which were taught by the author. Since this particular course enjoys a very loose format, it was quite easy to design this exercise into the total program. The total number of subjects involved was 71.

The stimulants chosen for this exercise were coffee and tobacco. Coffee because of the recent article in Science (Coffee and Heart Disease: Is There a Link?), Science, 181, 534-535, 1971) and tobacco because of the present concern of its possible contribution to heart disease. Coffee was made available on the day of the exercise.

Preliminary instructions were given to the students at the class meeting preceding the day of the exercise. These instructions consisted of simply requesting that all students refrain from smoking or drinking any coffee prior to their classroom attendance and instructing them as to the proper procedure for determining the pulse rate.

On the day of the experiment, students were divided into groups of four whenever possible, otherwise groups of three. Each group consisted of one smoker, one coffee drinker, one control and one pulse taker. In the event that a group consisted of three people, then the control also served as the pulse taker.

Students were instructed to begin taking pulse rates immediately and to continue at five minute intervals until the pulse rate would no longer be effected by the exertion of walking to class (usually within 15 minutes). At this time the coffee drinkers were allowed to drink a cup of coffee and the smokers could light up. The pulse takers were instructed to continue taking the pulse rate at five minute intervals obtaining a minimum of three readings from which an average pulse rate would be determined. Due to the limitations of a 50 minute period and the need to correlate the data at the end of the period, it is difficult to obtain more than 3 readings.

The data were separately categorized according to sex - males

(Table 1) and females (Table 2). Note, however, that the end gain data represent only the average pulse rate at the end of the 15 minute interval.

It will be noted in Table 1 that two of the controls, unbeknown to the instructor at the time during which the experiment was performed, indulged in the pleasant pastime of eating cookies. The end gain data from these students were removed from the average for the group, but left in the table for the effect shown.

The data, as plotted in Figure 1, show significant increases in the pulse rate over this short time span.

One may conclude from these data that both coffee and smoking result in an increase in pulse rate thus producing an increased stress factor on the heart muscles for periods of short duration. One might well be tempted at this point to infer that such increases will have a long-term effect on the heart that might well prove to be detrimental. In addition, we might infer that the processes of ingestion will also have the effect of increasing pulse rates. No attempt was made to follow up this latter point. The data also show the apparent parallel effects of the stimulants as well as the initial differences in pulse rates between male and female subjects.

Obviously, this exercise can be modified in a variety of ways: from changing the time periods to employing other types of stimuli. This latter point is of particular concern to secondary school teachers who can scarcely condone smoking in their classrooms, even for the sake of science. But these teachers can easily substitute other factors which will demonstrate similar effects or can assign the exercise as a take home assignment.

(Please See Tables on the Following Pages)

Table 1. Effects of Stimulants on Male Subjects

Group	Control		Coffee		Smoking	
	Beginning	End Gain	Beginning	End Gain	Beginning	End Gain
1			80	101	76	100
2			67	76	84	92
3	67	67	66	75	76	80
4	76	81.5*			71	87
5	94	101*				
6	86	88			64	93
7	64	72			88	118
8					82	92
9			72	82	84	96
10			80	69	68	83
11	78	78	66	69	58	80
12	62	67			82	94
13					78	76
Average	71.4	74.4	71.8	82.3	72	87.3

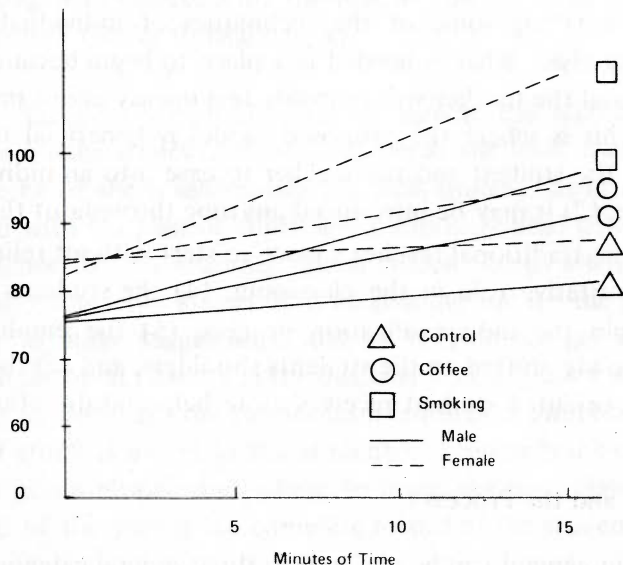
*Cookie Eater

Table 2. Effects of Stimulants on Female Subjects

Group	Control		Coffee		Smoking	
	Beginning	End Gain	Beginning	End Gain	Beginning	End Gain
1	76	77				
2	77	78				
3	96	96	82	84		
4	70	72	76	97	75	92
5			78	90		
6			80	84	80	108
7			67	73		
8			68	68		
9			64	78		
10	82	80	90	105		
11	72	72				
12	72	76				
13	81	84	85	94		
14	78	82	90	88		
Average	78.2	80.1	78	86.5	77.5	100

Figure 1. Effects of Two Stimulants on the Pulse Rate Over

A Fifteen Minute Time Span



A MODEL FOR IMPLEMENTING INDIVIDUALIZATION IN THE SCIENCE CLASSROOM

Barton Philipps, Harrisburg, Pennsylvania

Teachers today find themselves in the middle of tremendous education changes and as teachers they will be expected to play an important part in implementing course revisions. Which part shall they play? Some have closed their eyes to the new directions and hope they will go away, but like the ostrich these teachers are just fooling themselves. The numbers of open classroom elementary schools are increasing and the traditional ways of presenting science in the high schools will encounter greater student resentment. It therefore behooves teachers to begin to look for a way to introduce change in their classroom. What I propose is a model which shows how to easily lead the students into an individualized science program.

The word "individualize" seems to be everywhere and a clear and concise model of how to incorporate it into the classroom is needed. It is not feasible to walk into the classroom and tell the students to "do their own thing" because for so many years they have had every-