

# Epinephrine, Emotion, and Memory

David A. Gray  
Messiah College, dgray@messiah.edu

**Abstract - This paper discusses deliberate actions chosen to promote emotional response with the intent to enhance student memory of things I have wanted them to remember. The purpose of this discussion is to foster interchange among us of successful things of this nature that we have done. The actions listed here include humor (Anna Russell's "Psychiatric Folk Song"), practicing graduation, yelling at the top of my lungs (it is fun to watch the levitation), safety pins, singing songs a cappella (what is a septuagenarian doing singing to us), stories (ones I cannot tell without emotion). Here is one quote from a student portfolio suggesting something is working.**

**"I had a class MWF at 9:00 and everyone fell asleep, but then I realized I came to your class at 8:00 on Tuesday, and everyone stayed awake."**

*Index Terms* – First Year Experience, Promoting memory, Unusual delivery

## ADVICE RECEIVED

Just a few weeks prior to my teaching, a person [1] with years of experience working with young men and women, asked me, "Do you know how to get people to remember what you say?" Since I did not, he said that to do so you need to create an emotional reaction, any emotional reaction - laughter, fright, tears, etc. Emotion causes epinephrine, the enzyme that solidifies memory, to flow. I knew immediately that it works. I can never erase the vision of our driver in Mali hitting an old man on the road. Research supports that fact. [2] I have found it works with students.

My brother, someone who loves to teach, said a similar thing. "If you are enthusiastic about your subject, you will be successful ninety-five percent of the time." Having followed the two pieces of advice, ...

## APPLYING THE ADVICE

I now discuss a number of things I enthusiastically have done in four lectures, sometimes for fun, sometimes for deeper emotional impact.

### I. Promoting sticking with goals:

How do you convince students that they can succeed, and to do so, they may have to struggle through difficult times? I tell a story about the Los Angeles Olympics. I cannot recount the event without choking up. It involved the team

championship for the woman's gymnastic teams. For the gold medal, the team needed one good vault from a gymnast who on her first vault had landed amiss and creamed her foot or ankle. She had a second vault coming, but could she pull it off? I then act the part of Bela Karolyi looking into her eyes with his right fist raised saying, "You can do it. You can do it." She did it. She landed the vault correctly only to collapse. The emotion I still feel transfers. There is silence. Most of the time when I use the story, it will be the last thing I do in the lecture. Students remember.

### II. Promoting personal responsibility:

To get students to take responsibility for their academic careers, I discuss the learning assessment results each student receives after answering an on-line questionnaire. The assessments suggest style-specific approaches that help lead to better academic performance. I point out that the approaches provided do not in any way state or infer that a learning style is an excuse. I then hammer using quotes, etc., to show the absurdity of making excuses. I pound five times:

#### • I recite from Shakespeare:

"This is the excellent foppery of the world: that when we are sick in fortune -- often the surfeits of our own behavior -- we make guilty of our disasters the sun, the moon, and stars, as if we were villains on necessity, fools by heavenly compulsion, knaves, thieves, and treachers by spherical predominance, drunkards, liars, and adulterers by an enforced obedience of planetary influence. An admirable evasion of whoremaster man, to lay his goatish disposition on the charge of a star!" – Edmund in King Lear, Act 1, Scene 2.

#### • I recite from Shakespeare

"The fault, dear Brutus, is not in our stars, But in ourselves, that we are underlings." – Cassius in Julius Caesar, Act 1, Scene 2.

#### • I recite Anna Russell

...  
At three I had a feeling of ambivalence towards my brothers  
and so it follows naturally I poisoned all my lovers.  
but I am happy now I have learned the lessons this has taught:

Everything I do that's wrong, is someone else's fault! -  
Psychiatric Folksong

- **I then sing Jimmy Buffet's Margaritaville:** The progression of choruses leads to the drunk finally admitting his circumstances are his own fault. The progression:

"Wastin away again in Margaritaville  
Searching for my lost shaker of salt  
Some people claim that there's a woman to blame  
But I know it's nobody's fault."

...  
Some people claim that there's a woman to blame  
Now I think  
Hell, it could be my fault."

...  
Some people claim that there's a woman to blame  
But I know it's my own damn fault."

- **I discuss Theodore Darymple's Life at the Bottom:** In the give accounts of dealing with the derelicts and criminals in the Soho district of London. Primarily he emphasizes taking personal responsibility

Do students remember? Yes. I have on my bulletin board a dinner napkin from one of Buffet's Margaritaville Restaurants that a group of students brought back to me from a S. W. E. conference. Perhaps singing to the class is the weird thing, but Anna Russell's punch line creates laughter.

### III. Promoting metacognition:

I tell a story based on my experience working out with two water polo players over a seven-week period. The two asked me to work out with them in goal between their college and AAU seasons because they were gunning to make the Pan Am games. The two approached practice quite differently. The better player paid attention to the outcome of every shot, and if I blocked four in a row of any particular shot, he called a conference. He wanted to know how he was tipping his hand. After the discussion the next time he took the shot, it went by me. He won the outstanding player award in the Pan Am games that year, and I know why. He became the best because he practiced his version of metacognition.

Do students remember? In portfolios submitted by students at the end of the course, some students recount how the story got them to practice metacognition. This year in discussion, a recent graduate even remembered the water polo player's name.

### IV. Promoting proper oral presentation:

In teaching oral presentation, I do several things to help students remember. This lecture is the most intense that I give because I believe I must model exactly what I am telling them to do.

- **Discussing visuals** When discussing visuals I declare there is something I never want them to do. I repeat the words never and ever several times. Then I pretend they were not listening, and out of the blue I shout, "Never!" at the top of my lungs. It shocks them. The nodding few suddenly wake up. Then I tell them never to put up a typewritten page as a visual. The reason is, of course, that their audience will strain to read the page when it should be listening to them. I then discuss the idea to make visual pictures, and to avoid words if possible. I demonstrate the use of pictures instead of words.
- **Discussing gestures:** When discussing use of hands in presentations, I emphasize that hands do not belong in pockets. Based on a seminar on presentations I attended, I tell students that if they cannot keep their hands out of their pockets to pin them shut. That is fine, but to emphasize the point, at the end of the lecture we practice graduation. Our department chair and I put on regalia while the student get in alphabetical order. We present each with an envelope that contains a certificate (sample below). When they open the envelope, they find two safety pins fastened to the certificate
- **Discussing appearance:** This year I decided to suggest that when they give a formal presentation, they should dress neatly. Therefore, I did something offbeat. After announcements and assignments at the beginning of class, I went and picked up a tie and meticulously put it on, and then I put on my blazer. I said nothing, went to the lectern, and gave the lecture. As a result, the number of groups that dressed neatly when giving their assigned engineering design reviews soared.

Do students remember? They sure do. I have read a few student portfolios that have said they got more out of this one lecture on the subject than in a whole semester of their oral communications class. Some comment on my yelling. After having given the presentation only two years, I had seniors who had never heard the lecture fret about putting their hands in their pockets when rehearsing their senior presentations with me there. Somebody had told on me.



There are more things I have tried, and most worked. The specific examples above are just that, examples. Although they may not appeal, the bottom line is this; use your imagination and do the different. Create emotion, whether empathy, fright from a scare, laughter, or any kind of excitement and students will remember better. Simply displaying enthusiasm about your topic will create positive results if no more than to keep the class awake. If you are venturesome and throw wicked curve balls, you might end up surprised by the number actually caught.

#### REFERENCES

- [1] Conversation with Joslin "Josh" McDowell
- [2] Cahill, Larry, "Epinephrine enhancement of human memory consolidation: Interaction with arousal at encoding", *Neurobiology of Learning and Memory*, Vol. 79, March 2003, pp. 194–198