I. INTRODUCTION: This article will describe a unique set of procedures used to develop a critical analysis repertoire. These acquired skills in thinking critically will be used in a variety of university courses taught by the first author. The students see supposed psychic feats at the beginning of each class. They actually see what is more technically called in the professional trade, “mentalism” or “mental magic tricks.” These are presented in a “psychic-like” fashion. Students are to write explanations for these staged supposed psychic events. In their writing, students are to use real world descriptions and/or the scientific principles that account for the supposed psychic events. As the course progresses, the student will learn new critical analysis repertoires via other handouts. Hopefully, these new repertoires will be useful in the critical analysis of the class stunts, but more importantly, in needed situations that may come up in the future during the daily life of the student.

The term “critical analysis” is used here instead of “critical thinking” because the term “critical thinking” has become, at times, a dirty word, i.e., critical thinking has, in certain places, taken on a mystic and less scientific ring and is often used without any critical thinking taking place. A critical analysis repertoire is learned, as is any other repertoire, through interactions with the environment.

II. WHAT THE STUDENTS WORK ON IN CRITICAL ANALYSIS
PROCEDURE: The first author tells the students in advance that they will see fake psychic demonstrations, for example: metal bending, levitation, mind reading, psychic predictions, telepathy, mind control, psychkinesis (P.K.), psychic question and answer (Q & A) techniques, play on coincidence, psychic readings and other supposed psychic events. They are instructed to critically analyze these supposed psychic events; thus for at least one trial in their searching process, students are “vaccinated” against fraudulent psychic explanations. Is this a “vaccination” for life? Probably not. This type of “vaccination,” like so many other things in life, will need intermittent environmental booster shots. Our critical analysis repertoires continually need updates and repair work.

III. AT WHAT POINT IN THE COURSE ARE THESE PROCEDURES IMPLEMENTED: The first author initiates these critical analysis procedures as soon as the class content and procedures of the course are running smoothly. The first author also uses daily oral and written feedback procedures in all of his classes; therefore, it takes a number of class sessions to get the procedures and specific course content up and running smoothly. Once implemented, these critical analysis procedures are generally used on a daily basis, except when requirements of a course might otherwise demand it.
IV. A PROCEDURE FOR ALL SEASONS: The first author uses these critical analysis procedures in all of the classes that he teaches. The critical analysis material comes as an addition to the specific course’s content. All courses can use some critical analysis scrutiny applied to its procedures and/or content. In the author’s experience, “critical thinking” courses, course units on critical thinking, and/or university wide general education “critical thinking” requirements need regular critical analysis scrutiny. Frequently noted by the authors is that many authors and teachers define “critical thinking” as what they do, while non-critical thinking is what others engage in!

V. STARTING POINT FOR THE PROCEDURES: Once the class procedures are running smoothly, the first author initiates this critical analysis procedure with a handout about Clever HANS, a horse with a supposed math ability, among other skills. This Clever HANS handout is broken into the 3 parts listed below.

A. Part One: This is the classic story of how Oscar Pfungst debunked the claims that a horse called Clever Hans had extraordinary intellectual ability in a number of areas. Pfungst found that the supposed math ability was really subtle cues provided to the horse. The need for critical analysis skills to find the cause of extraordinary claims is emphasized throughout this whole procedure.

B. Part Two: The second part of this Clever Hans handout contains excerpts from an article by Robert Steiner entitled, “Confessions of a Magician.” The excerpts illustrate that skeptics themselves must be careful in their explanations of events. The author, Steiner, was a magician performing in magic show that took place at a skeptics convention. Steiner talked about Clever Hans. He then performed a card trick. After the show, members of the skeptics group questioned Steiner, not on the card trick, but rather on the false assumption that he was able to pick up on subtle cues provided by members of the audience.

C. Part Three: After reading Steiner’s article, the first author decided to see what would happen if his students learned about Clever Hans by reading excerpts from “Confessions of a Magician” and then also reading excerpts from previous letters that the first author had sent to Steiner about this procedure. These letters told of the results from previous use of the procedures that you are now reading. The data shows that the majority of students also believed that the card trick was done with subtle cues, rather than just being a card trick.

VI. HISTORY OF THE CRITICAL ANALYSIS PROCEDURES -- ELLERY
QUEEN /GHOSTBUSTER'S/SCOOBY DOO CONTEST: When the first author came to teach in the Psychology Department at St. Cloud State University some 37 years ago, he did not have a magic repertoire or any special interest in the area of magic. A number of students would ask questions like, "How do you, as a behavioristic experimentally oriented psychologist, account for supposed psychic or paranormal events?" So, the first author began to do research in the area of the students' questions, and he found that magic and related repertoires were employed by the supposed psychics. Since then, a behavioral look at psychics and magic have been a strong area of interest to the first author.

One of the teaching devices the first author developed based upon his early college teaching experiences is the procedure being described here, the Ghostbuster/Ellery Queen/Scooby Doo E.S.P Detective Contest." It is a fun time in class; yet, it exposes the student to a crucial critical analysis procedure. It is a critical analysis training session. The students' writing task is to work their environment against themselves. This process involves what the student sees, compared to their repertoire of past learning about the material under consideration, as well as their science knowledge. The winner of this contest (the best detective) is determined by the best student analysis during the whole term. Clues may be given which may help the student detective reach a partial solution. Since the mysteries (mental magic stunts) are by design puzzling, any part of the mystery explained by the student results in a better score on the Ellery Queen contest. These are not grade points for the course, but rather are points only for the Ellery Queen/Ghostbusters/Scooby Doo award. (see attachment to the handout). Partial correct guesses do count, and the session winner usually is a student detective who quite regularly guesses a few of these parts. At the end of the term, the student learns if he or she is the winner of the award, but does not get feedback on each guess since this is not a magic expose. This is a chance to play detective, or if you prefer, practice in developing a critical analysis repertoire. The elegant award certificate given to the winner summarizes the objective nicely: "Name of Student: Congratulations on winning the "Ghostbuster/Ellery Queen/Scooby Doo of E.S.P." at the (Name of Class). This, the most coveted of awards anywhere, is presented to those who have skills like Ellery Queen, the Ghostbusters, and Scooby Doo. In the footsteps of the Ghostbusters/Ellery Queen/Scooby Doo, your high level of correct explanations of these supposed E.S.P. activities indicate an outstanding level of skill in analysis of complex behavior. Good job."

This detective routine is novel, fun, and provides good critical-analysis training. Many of the mentalism (mental magic) stunts used by the first author are the same props and techniques used by supposed "real psychics." In the past, St. Cloud State University paid some supposed "real psychic" some $2,000 to use the same gimmicked $3.25 deck of cards that the first author uses in some of his courses.

VII. DEBUNKING: For many years the first author saw that his course objective,
to get critical analysis into the student's repertoire, would best be accomplished by teaching how a rigorous science of behavior can account for an explanation in the most parsimonious way. The first author, being a psychologist with a behavior analytic orientation, holds to the position that the behavior analytic approach is the most scientifically rigorous of any explanation offered today.

More recently the authors came to a position that this behavioral orientation can be taught faster and even more effectively using another technique of science, debunking. Debunking is defined in the dictionary as, "To strip or divest of pretentious, false, or exaggerated opinions, sentiments, or claims." Debunking can help show the shortcomings of inferential explanations of the traditional mentalistic approaches. As long as the false mentalistic explanations typical stay untouched, there is for some students, no reason to look at alternative explanations that are available. Without debunking, the person may hold to the traditional view without giving the new, more rigorous account of behavior a fair opportunity to become part of their repertoire.

VIII. PROCEDURES NOT AN EXPOSE OF MAGIC: This process is not an expose of magic, but rather a critical analysis exercise. Historically, an interesting incident took place which illustrates how telling a person the explanation of supposed psychic feats does not necessarily improve their objectivity in reference to their explanations of extraordinary events. This incident offers further support for non-exposure of the explanations. A number of others who teach courses in related areas have tried similar fake psychic demonstrations. During a discussion with a sociology faculty member from another university, who did similar activities and used similar teaching methods produced opposite results. The colleague found that this type of demonstration had little or no effect in changing a student's statements toward a more objective analysis of extraordinary claims. However, the first author had found that these demonstrations were a useful method to change these kinds of opinion statements. (see data below) We discovered, as we looked at the apparent contradictory result, that the one difference in our procedures was that one gave an explanation after the demonstration and the other gave no explanation. The colleague informed the students how he performed this supposed paranormal feat. For example, he told the students how a key was bent. His psychic believing students could then later contend something like, "Our instructor bent metal by a trick," i.e., meaning by the method the student had been told was used by the instructor. They would go on to contend, "However, real psychics do their feats by real psychic power." For these students, "psychic" meant a method that looked different from the one they were taught, thus it was the way real psychics do it. The first author's students are not given explanations for a trick they just saw. They see a supposed psychic event, but they see it done by the first author, a known magician, a known fake "psychic", and a debunker of psychic claims. All they have is a known fake psychic magic trick that looks just like a supposed real psychic event.
IX. HANDOUTS USED IN THIS CRITICAL ANALYSIS PROCEDURE: The following is a list and short description of the handouts used in classes:

Handout #1: A Study of Critical Analysis A Start of How to Use Science to Solve Problems

Handout #2: Introduction

Handout #3: Hints for Critical Analysis in Class Activities and Daily Life: This handout serves as a starting point for developing a specific repertoire in utilizing critical analysis. The objective of the handout is to help students develop critical analysis repertoires that can be used to analyze the events that are used at the start of class, and more importantly, to develop these same critical analysis skills for use in daily life.

Handout #4: A Quick Lesson on How to Become a Psychic: This article covers a wide-range of extraordinary claims used to deceive. A handout where students played a major role in producing "stuff" you might get from a supposed psychic.

Handout #5: Some Critical Analysis Methods to Consider: This article is geared towards offering many traditional suggestions for critical thinking/analysis such as: ad hominid argument, straw person, etc.

Handout #6: Is Less Than Chance Being Called Psychic?

Handout #7: Possible Consequences/Reinforcers for Psychic Behavior.

Handout #8: What is Lost In the Objective Scientific Approach To Human Behavior? (And Just What is Wrong With Not Being Objective?)

Handout #9: A Case Against Irrationality

Handout #10: Physical Analysis of the World Around Us - What Ways Can We Make It Look Like Science Principles Are Not At Work?:

Handout #11: Cult practices and Critical Analysis

X. "FRINGE" BENEFITS: There are certain fringe benefits to using this method. Student evaluations indicate that students find it entertaining, fun, interesting and useful. The procedure also promotes writing skills not found in many academic situations, that is, the student sees an event that requires new repertoires to explain. The student quickly has to put this into a written, concise format which is a difficult task for even the professional writers.

XI. STUDENTS’ EVALUATIVE COMMENTS: What we have attempted below is
to take excerpts of student's evaluations of this procedure and summarize these with some phrases derived from their comments:

-a training session in problem solving and critical thinking
-towards an objective analysis of extraordinary claims
-a way of "reversing" 20 years of mentalism training
-to view events more from an objective standpoint
-to use observation rather than conjecture
-look for tangible reasons for what I may have accepted as unexplainable
-not believing everything one is told, but to look at what is going on
-not just look and believe, but to make us less gullible
-an aid to improve our debunking skills
-helping us be aware of the functional relationships
-show that illusions are not only entertaining but they can be educational
-to look at what the person actually did, vs. what the person said they did
-getting actively involved in class sessions, to change our outlook on things
-people can be tricked by being told to view things in a certain way
-keep the class fun and useful, help us enjoy the course as we learn
-help us see social deception is a core to many social problems like racism, sexism and other irrational behaviors

XII. SOME OF THE SUPPORTING DATA: Below are the results of a study based on the effects of this critical analysis. The mean value before and after psychic opinion test scores are compared. On this particular survey a lower score represents a more objective verbal opinion. The first score is the before score. After the "/" is the after score.

****************************** Before/After
-A Psychol. course in the area of illusions----------------- 32/22
-A core Psych. course with fake E.S.P. demos----------- 29/26
-An Intro. Psychol. course with no magic----------------- 25.6/25.3
-An Introductory Psychology Course using magic and debunking telelectures----------------- 30/15
-A core Psychol. undergraduate course with fake E.S.P. demos and debunking demos------------ 21/12
-An Intro. Psych. course using daily demos------------- 24/0.58
-A core Psychology course using daily debunking and relate text-------------------------------- 26/0.56