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Increasing Student Perceptions of Relevance in Introductory Statistics

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This classroom research study explored whether adding a trade book, Best's (2001) Damned Lies and Statistics*, to an introductory statistics course increased students' positive perceptions of the relevance of statistics to their personal and professional lives. The teacher-researcher explored three data sources to assess perceptions: (a) a pre- and post-course survey of students' perceptions, (b) observations of group discussions, and (c) a comparison of median ratings on faculty evaluations for classes that did and did not read the Best (2001) text. Through mixed-methods analysis, ratings and the reasons students gave for those ratings led to a variety of observations in the data that indicate some change in perceptions from the first to the last day of class. The direct impact of the trade book, however, is unclear. The discussion focuses on addressing relevance in introductory statistics classrooms and steps the teacher-researcher plans to take in the next classroom research cycle.*

An article by George Cobb (1992) is frequently cited as the beginning of a reform in introductory statistics instruction. The main message of this call is for instructors to minimize their emphasis on calculations and rote memorization of formulas and instead focus on helping students develop an understanding of what statistics are all about. This includes understanding concepts (e.g., what is a correlation?) and relationships among concepts (e.g., how are correlation and variability related?), but instructors are now also encouraged to help students make connections between these statistical concepts and students' everyday lives. Iddo Gal and Joan Garfield (1997) argue that balancing "doing statistics [e.g., formulae and mechanics] versus being

informed consumers of statistics [e.g., understanding the role of statistics in the world]" (p. 5) in the same course is one of the major challenges facing statistics educators today.

Jessica Utts (2002) also argues that one outcome of learning introductory statistics material should be that the student is a more "educated citizen," especially given a variety of changes in the "world around us" (p. 1)—chiefly, individuals now have more access to more information more quickly than ever before. With this surge of information, much of it statistical in nature, comes the need for individuals to understand what the information does and does not say. Students must also be able to evaluate the quality of this information and discern "good statistics" from "bad statistics" (Best, 2001; Gal & Garfield, 1997).

As recently as 2000, the National Council of Teachers of Mathematics agrees, indicating that "to reason statistically—which is essential to be an informed citizen, employee, and consumer—[K-12] students need to learn about data analysis and related aspects of probability" (National Council of Teachers of Mathematics, 2000). Beth Chance (2002) argues that introductory statistics students should develop the mental habit of holding an "omnipresent skepticism about the data" (Section 3, ¶ 1). Chance goes on to say, "students can be instructed to view statistics in the context of the world around them … thus, students can be led to appreciate the role of statistics" (Section 3.6, ¶ 1). These authors discuss what I would call *personal relevance*, or how students see introductory statistics as connected to their personal (i.e., non-work) lives and the world around them.

For many students, introductory statistics is a part of their degree program requirements (Zeidner, 1991), especially at the graduate level. This requirement highlights the role statistics and data-based decisions play in their respective fields. These connections to students' future careers describe what I refer to as *professional relevance*—how students see introductory statistics as connected to their work lives. Although individuals' work lives and personal lives are often related, statistics used at work (e.g., data included in reports, data used to make workplace decisions) often differ from statistics used outside the workplace (e.g., polls conducted by popular magazines, numbers presented during nightly newscasts, or comparative information individuals use to make purchases).

For example, my own students are graduate students in the College of Education and Human Development, which means a large percentage are practicing elementary, middle school, and high school teachers and administrators. Many fail to see any direct professional relevance because they will "never use [statistics] in their own classroom." Some see the connections to research that districts use to support a new curriculum or descriptive statistics used to present standardized assessment results, but for the most part my students are at a loss to explain why they are even required to take a statistics class as part of their master's degree program.

Regardless of whether students see the connections statistics have to their professional lives, researchers have advocated increasing students' connections with course material through the use of "real world data" (Fillebrown, 1994; Lesh, Amit, & Schorr, 1997; Wardrop, 2000) and classroom projects (Chance, 2002; Starkings, 1997). Chance (2002) and Smith (1998) both conclude giving students ownership of the data should lead to an increased interest in the results of the various statistical analyses they conduct with those data. Sieber and Trumbo (1991) argue, "use of real data provides an excellent opportunity to teach the relevance of statistics" (p. 133). The idea supported by these and other statistics educators is, if instructors motivate students to learn the material by making these "everyday" connections, they will be more engaged in the classroom (Reid & Petocz, 2002). This, in turn, should lead to an increased understanding of the material. All of this rests on the assumption that students do see connections to or meaning in these data and exercises we develop. As Bliss and Tashakkori (2001) indicate, "The everyday life of students is very complex and we could exhaust ourselves trying to deal with every particular and nuance of this life" (p. 4).

This complexity should not deter instructors from continuing to find ways to connect statistics to our students' lives outside the classroom. If personal and professional connections do motivate students to learn the material, then "investigating [this] affective dimension of statistics learning adds another dimension to the development of effective pedagogy in statistics" (Reid & Petocz, 2002, Section 1, ¶ 1). In other words, statistics educators need to first find out how connected students feel with introductory statistics content. We then need to find ways to maintain and increase any positive

connections: "An obvious solution to the dilemma is to first ask students of statistics how they understand statistics and then use this information to develop learning activities" (Reid & Petocz, 2002, Section 1, ¶ 4). Garfield (1995) also encourages statistics instructors to "experiment with different teaching approaches and activities and monitor the results, not only by using conventional tests but by *carefully listening to students*" (p. 32, emphasis added).

With these initial ideas in mind, I developed the current classroom research study to explore students' connections with course content by capturing and listening to students' thoughts about how relevant statistics is to their personal and professional lives. This particular phrasing comes from our end-of-course teaching evaluations, on which one of the questions addresses how relevant the material is to their personal/professional lives (all in one question). The specific purpose of this study was to introduce a trade book (e.g., non-textbook) into my course syllabus and evaluate whether students saw statistics as more relevant to their lives (personal and professional) at the end of the course than they did on the first day of class.

Methods

To evaluate the impact of the new book on students' thoughts about statistics, I was guided by James McKernan's (1991) model for curriculum action research. Figure 1 is an adapted depiction of the overall process; I have organized the following methods section to mirror that process. The classroom action research begins with teacher-researchers identifying their area of focus—some aspect of the classroom environment that they are interested in formally exploring. The teacher-researcher then begins a reconnaissance phase, during which he or she explores what others have presented related to that area of focus by conducting a literature review, exploring available resources, and/or collaborating with colleagues (Hubbard & Power, 2003; McKernan, 1991; Mills, 2003).

This leads to the development of specific goals for the study (parallel to "research questions" in traditional research settings), expectations for how the classroom will be different as a result of the study, and the development of an action plan. The action plan is the specific process laid out by the teacher-researcher to implement some

new idea (e.g., teaching style, assessment, or classroom activity) and evaluate whether the change works. The teacher-researcher then completes a classroom action research cycle by evaluating the data, reflecting on the study, and developing a new action plan based on the results of the first. In this way, classroom action research is a cyclical process, with data from one cycle guiding the teacher-researcher as he or she continues to enhance the classroom environment.

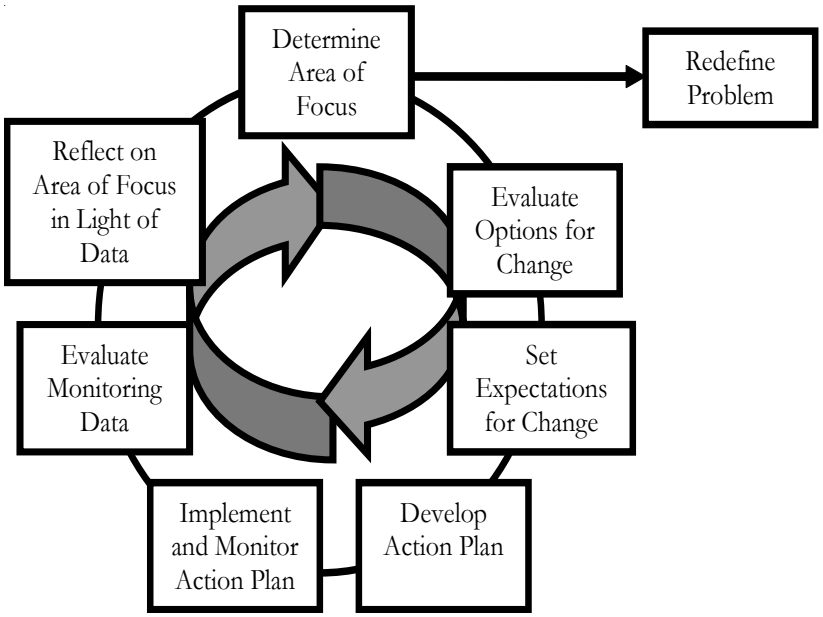

Figure 1. Classroom Action Research Cycle, adapted from McKernan (1991).

Area of Focus

Based on the literature discussed earlier as well as my own informal observations of my introductory statistics classroom, I chose to focus this study on increasing students' perceptions of the relevance of statistics to their personal and professional lives. What I wanted

was some resource or set of activities that I could weave into the current course structure, taking students out of the "doing statistics" (Gal & Garfield, 1997) mode for a moment to explore what these concepts mean to them outside the classroom. As suggested, the use of "real world data" (data that are not made up but come from real sources such as the US Census Bureau or a state Department of Education) and projects are two ways to enhance students' perceptions of the relevance of statistics—I have used both these tools for years and still find students' perceptions of relevance to be overwhelmingly negative.

Reconnaissance

This led me to seek out alternatives in the literature, through websites devoted to teaching statistics (e.g., www.causeweb.org), and my colleagues. As it happened, however, the resource I felt I was looking for appeared in my local bookstore: a book by Joel Best (2001) called *Damned Lies and Statistics*. The book appeared easy to read and clear in its argument that "educated citizens" (Utts, 2002) should think critically about the data they hear and read before accepting any information as fact. With myriad examples, Best presents what I consider a student-friendly look at the process of creating and presenting arguments based on data. The specific questions I chose to address for this first exploration of incorporating Best (2001) into the classroom are:

1. Will students report more favorable perceptions of the relevance of statistics at the end of the course than they had on the first day? and,
2. Will students reading the Best (2001) text rate the applicability of this course to their personal and professional lives higher than students from previous sections of the course who had not read the same book?

The Action Plan—Incorporating the Text into My Course

In the Fall 2004 and Summer 2005 terms (across three course sections), I worked to fully integrate Best (2001) into the course using Dee Fink's (2003) model for significant learning. This means that I had clearly identified learning objectives for students, learning activities

meant to help students meet these objectives, and meaningful assessments to capture how well students met the learning objectives. It also means that these activities and assessments are not separate from, but rather integrated with, the current materials used in my course. Rather than create a "stand alone" thread related to this new text, I worked to make sure there was a seamless flow from the Best (2001) text to other course texts and activities.

The main learning objective I identified was that students would appreciate the role statistics plays in their personal and professional lives. To help students meet this objective, I have students read one chapter at a time, find a clip from any source that discusses statistics, and then engage in small-group discussions about the chapter and their media clips. Best's (2001) book is divided into six chapters plus an Introduction. I present the Introduction on the first day of class, and students read the six chapters one at a time every two to three weeks during the term. On the scheduled days, students break into small groups to discuss the chapter and their clips using either a discussion guide (see Appendix A for the Chapter 1 guide) or activity (see Appendix B for the Chapter 3 activity). I give groups about thirty minutes to discuss the chapter, and then we come back together as a whole class to summarize the group discussions and the main points of the chapter. I also point to connections between what Best (2001) discussed and the statistics concepts we have discussed in class.

Monitoring the Action Plan and Outcome Expectations

To monitor whether students were, in fact, seeing statistics differently from the first to the last day of the course, I chose three main data sources (Hubbard & Power, 2003; Mills, 2003): (a) brief minute-surveys on the first and last days of class, (b) students' formal course evaluations conducted anonymously on the last day of class, and (c) my own informal classroom observations of the activities related to Best (2001). I describe each of these along with my expectations next.

On the first day of class, I asked students to respond to four questions (see Appendix C): "How relevant is statistics to your personal/professional life" on a scale from 1 to 5 (two questions, one for professional and one for personal), and "Explain why you selected this

value." I used the words "personal" and "professional" because those are the words used on our faculty evaluations. I chose a 5-point scale for the same reason. I transcribed written responses and summarized ratings for each question. Students completed the same survey again on the last day of class—I linked first and last day surveys with an ID number assigned to each student so that I had pre-course and post-course data for each individual student. My expectations were (a) ratings would be higher on the last day than on the first, and (b) students' comments on the last day would incorporate some of the ideas from Best (2001) to support their selected rating.

Also on the last day of class, students complete the standard faculty evaluation. One of the questions on this evaluation asks students about the "applicability of this course to your personal and professional life." As these are anonymous evaluations, I use group data from entire sections of the course rather than individual data by student. From eight sections of this course prior to incorporating the Best (2001) text (n = 186 students), the median rating for this item was 2 on a scale from 1 (Very Poor) to 5 (Very Good). My expectation was this median value would go up as a result of students engaging in discussions of Best (2001).

I monitored and took notes during both the small group and whole class discussions about the material in Best (2001). I focused these informal observations on how engaged students appeared to be as well as how active they were in the group discussions. I also posed questions about the text to the whole class after these discussions (e.g., How do you like it? Is it easy to read? Is it interesting?). Again, my expectation was students would be actively engaged during group discussions about the text and they would enjoy reading the additional text (rather than complaining that it is a book about statistics). I took observation notes during each class meeting, and I expanded on these immediately following each class meeting (Hubbard & Power, 2003).

Evaluating the Action Plan

Table 1 summarizes students' (n = 89) ratings for personal and professional relevance on the first and last day of class. A scan of Table 1 shows a clear difference in rating patterns for personal and professional relevance across both survey administrations: a much larger

percentage of students selected a rating of 4 or 5 for professional relevance than for personal relevance. The correlation between the personal and professional ratings on the first day is $r = 0.28$, and the correlation for the ratings on the last day is $r = 0.23$; both of these values indicate students who rated personal relevance higher also tended to rate professional relevance higher—this relationship is weak at best.

For those students completing both surveys ($n = 70$ matched pre-post surveys), median ratings stayed the same for both categories from the first to the last day of class; on average students rated professional relevance (*Mdn* = 4 on both first and last day) higher than personal relevance (*Mdn* = 3 on both first and last day). Thirty-four percent of these students kept the same personal relevance rating from the first to the last day, 46% of the students' personal ratings went up, and the remaining 20% of the students' personal ratings dropped from the first to the last day (personal ratings from the first day to the last day correlated $r = 0.40$). For professional relevance, 41% stayed the same, 36% of the students' professional ratings went up, and 23% dropped from the first to the last day of class (professional ratings from the first day to the last day correlated $r = 0.39$).

Table 1. *Students' (*n = *89) Ratings of Personal and Professional Relevance*[1]

	First Day of Class		Last Day of Class	
	Personal	Professional	Personal	Professional
Not at all Relevant	10.3	2.3	3.0	1.4
2	20.7	4.5	11.9	2.9
3	41.4	19.3	56.7	14.5
4	21.8	45.5	31.3	40.6
Very Relevant	5.7	28.4	11.9	40.6

[1]Figures in table represent percentage of students selecting each rating.

I also compiled written comments (184 total comments for personal relevance and 182 total comments for professional relevance on the first and last day combined across all 3 sections) for comparison

across both the personal/professional dimension and the first day/last day dimension. I coded these comments based on what I thought was the main idea presented by the student. For example, "I see statistics in the newspaper" was coded as "See Statistics in Media." A statement such as, "Politicians and other important individuals use statistics to make decisions that impact my life" was coded as "Statistics Used to Make Decisions." If the student indicated *they* were making the decisions (e.g., what to buy or how healthy they are), I coded the comment as "Use for Personal Decisions." A graduate assistant not in my course independently coded 20 statements as a check on my own coding—our codes agreed in all cases except two, which we did agree upon after discussion. Tables 2 and 3 summarize the major categories of comments for each section of the survey along with the percentage of students' comments falling into that category on the first and last days of class.

Table 2. Coded Comments (n = 184 comments) of Personal Relevance on First and Last Day Surveys[1]

	First Day of Class	Last Day of Class
Use for Personal Decisions	15.5	10.1
See Statistics in Media	10.7	21.5
Statistics Used for Decisions Made by Others	13.6	12.7
Not Relevant Personally	29.1	21.5
Unsure of Relevance	10.7	3.8
Important for Degree Program	11.7	10.1
Other	8.7	20.2

[1]Figures in table represent percentage of comments coded in each category.

Table 3. Coded Comments (n = 182 comments) of Professional Relevance on First and Last Day Surveys[1]

	First Day of Class	Last Day of Class
Never Use Professionally	10.8	2.5
Use for Major or Degree	23.5	20.0
Use to Evaluate Student Data	22.5	25.0
Used in Reports and Policy Decisions	12.7	5.0
Other On-the-Job Uses	15.7	7.5
Use to Read and/or Write Research	4.9	18.8
Other	9.8	21.3

[1]Figures in table represent percentage of comments coded in each category.

There are some interesting comparisons between these two tables. Consistent with the lower median rating for personal relevance, students indicated in 29.1% of the personal relevance comments that statistics are *not relevant*, whereas students indicated this in only 10.8% of the professional relevance comments. I take it as a good sign that both of these percentages decreased by the last day of class (to 21.5% and 2.5% respectively), so that a smaller number of students saw statistics as not relevant on the last day of class than on the first day of class. I also found it interesting that no students were "unsure" of the relevance of statistics to their professional lives—each student either indicated it was not relevant or gave examples of how it was. However, in 10.7% of the personal relevance comments, students indicated they were unsure how statistics was personally relevant to them; again, this percentage dropped by the last day of class to only 3.8% of the comments.

Another striking observation from the comment data is the clear difference in how students defined the word "statistics" while responding to the relevance survey. One student, for example, indicated statistics is not relevant to her personal life because "my husband pays the bills." Another student "[tries] not to analyze, interpret much—just enjoy time with my family and friends." Contrasted with these comments are comments from students who referred to hearing statistics

presented on TV or reading statistics in magazines or the newspaper, students who indicate they use statistics on the job, students who say they make personal decisions based on statistics, and students who recognize statistics in other courses.

On the last day of class prior to the final, students traditionally complete the official course evaluation for the College. I used one item from this evaluation to compare students from eight prior sections who did not read the Best (2001) book with students from these three most recent sections who did read Best. The item asks students to rate the "applicability of this course to your personal and professional life" on a scale from 1 (Very Poor) to 5 (Very Good). Using Mood's Median Test, I compared the 8 "no Best" sections with the 3 "Best" sections. This difference in group distributions around the common median of 2 was not statistically significant: $X^2(1) = 0.78$, $p = .38$, indicating no difference in how students rated the relevance of the course between classes that did and did not include the Best (2001) text.

Most interesting, however, is that given the more "academic" context of these faculty evaluations, students' median ratings on this evaluation were two points lower than on the professional section of the in-class relevance survey ($Mdn = 4$), where most students talked about the relevance of statistics to their degree programs, coursework, or upcoming masters' theses. Given the number of students who, in the past, have commented that "I'll never do this" or "I'm not doing a thesis" on these faculty evaluations, I expected them to be thinking about this item in a more professional context rather than personal. However, students' personal ratings on the relevance survey ($Mdn = 3$) are much closer to this median value of 2 than their professional ratings are. Unfortunately, faculty evaluations are anonymous so I cannot make more specific comparisons between responses to this item and those on the relevance survey.

My own observations of students' reactions to Best (2001) were mixed. Students did consistently report enjoying the book—it was very readable and they could understand what Best was talking about. Even though most small groups seemed genuinely engaged in the discussion questions, there were one or two groups in each section that appeared to "get through it" and socialize while other groups finished. I observed this much more toward the end of the term—group discussions of Chapter 1 all went very well and students had much to say. By Chapter

4, however, students began to comment that the book seemed to be repetitive, and they were not learning anything new from it any more. I noticed this myself as I struggled to come up with new activities for the later chapters, relying instead just on whole-group discussions before moving to other material. These observations led me to question the impact Best was having on my students' understanding of statistics—had I just introduced "something else to do?"

Reflecting on the Action Plan

I have to say I was surprised by what these data told me—not specifically about students' ratings, but rather about the personal-professional dichotomy and how exactly I connect course material to students' lives. Clearly these students see statistics as more connected to their professional lives than to their personal lives. Although many comments about professional relevance discussed coursework or degree requirements, 56.7% of comments on the first day and 77.8% of comments on the last day spoke to other professional connections. As Best (2001) focuses on statistics in the media, I do not believe his book impacted students' perceptions of relevance to their work lives to any large extent.

The dichotomous nature of personal and professional relevance became clear when I contrasted both numeric ratings and coded comments in both sets of data. Even though the overall ratings data indicate no major change in students' perceptions (i.e., the median rating stayed the same from the first to the last day of class), 46% of my students did see more relevance to their personal lives, and 36% of my students saw more relevance to their professional lives by the end of the term. These changes represent increases in students' ratings from the first to last day of class. As this is the first time I have used this survey, I am not sure what a shift from a rating of "3" to a rating of "4" means for students. I have decided to add a second question under each rating scale asking students on the last day of class if *they perceive* their rating has gone up, down, or stayed the same and why or why not.

Additionally, the percentage of comments in which students indicated no relevance or that they were unsure of the relevance on the first day dropped by the last day of class. Together, I take these

observations to mean *something* happened to positively impact students' perceptions of statistics—the question remains whether it was due to the Best (2001) book or other factors. The fact that students' ratings of the relevance on the faculty evaluations were the same for classes that had and had not read the book suggests Best (2001) did not play a major role—considering the course as a whole, students did not rate its relevance highly. What other factors need to be addressed?

First, how exactly do students define "statistics?" It is clear from the first and last day surveys that students think differently about the term "statistics"—some think of "statistics as numbers," others think of "statistics the course," and a third group thinks of "statistics the field." In order to successfully connect course material to students' incoming perceptions of what "statistics" means, instructors should at least take a quick informal poll of students on the first day of class to uncover their incoming definitions. The next question instructors then need to address is, "How do we define statistics for students in class?" Do we want students to define statistics in one way (e.g., "statistics as numbers"), or do we want them to see statistics in a variety of ways? How do we help students confront their incoming definitions, challenge them, and either support them or change them if necessary? What are the direct definitions students hear from instructors or read in textbooks, and what are the indirect definitions we imply through course design (e.g., that statistics is a "researcher-only" domain by spending half the term on inferential statistics)? What definitions of statistics would students give on the last day of class, and where would they say these definitions came from?

Second, most students in my courses (in a College of Education) are required to be there, and they do see some connection between statistics and their other coursework. This is typically through either (a) reading research articles in other courses or (b) preparing to write a Master's thesis or doctoral dissertation. Understanding inferential statistics from these perspectives is important for students, whether or not they extend these connections to their personal lives (e.g., the inferential statistics used to test the efficacy of a new drug). Some discussion of inferential statistics is important for an introductory course (typically the only course many non-majors will take). Additionally, the programs in which my students are earning degrees

require comprehensive exams or theses, and for both of these those programs assess students' knowledge of statistics through research (most commonly hypothesis testing).

Another question to address is how students' incoming definitions of "statistics" and perceptions of its relevance impact their approach to learning and studying in the course. Murtonen and Lehtinen (2003) suggest "that the conceptions students hold about statistics and methodology can have an impact on their learning of the subject" (p. 172)—but how, and to what degree? The statistics reform has emphasized students' conceptual understanding of the larger statistical concepts (e.g., variability). How are these conceptual understandings influenced by students' ability to "see" these concepts in either their everyday personal or professional lives? With 30 students in one classroom, each with varying ages, occupations, and interests, how can instructors effectively manage this diversity so that each student's understanding develops in his or her own context?

Implications for Practice—My Next Action Cycle

Based on these results, my understanding of the relevance issue has changed dramatically. This, in turn, has helped me reframe my initial problem area (McKernan, 1991; Mills, 2003). I now have a better understanding of the idea of "relevance" myself, and this understanding includes a heightened awareness of how relevance is presented *throughout* the term. Rather than adding one specific text and/or exercise to address students' perceptions, I am now concerned with modifying class discussions, assessments, and examples so that I am better able to help students develop a greater appreciation for the role statistics play in both their personal and professional lives. The correlation between students' ratings for personal and professional relevance on the first day of class was $r = 0.28$; on the last day this correlation was $r = 0.23$. Teachers cannot address one and assume they are addressing both. Data sets, class activities, and assessments need to be directed at both areas of relevance.

For my next classroom research cycle, one change I am considering is adding a portfolio activity in which students place and discuss statistics they see at work, in the news, and in other classes. My expectation is when students are forced to look for and discuss

statistics in both their personal and professional lives, they will begin to think about these in relation to course material. I am still considering a change in how I emphasize different topics, but I wrestle with the issue of how to balance descriptive and inferential statistics in one term. I would like to spend more time discussing descriptive and summary statistics, but I do not believe this should be at the expense of inferential topics.

Addressing just one aspect of class will not address the larger issue of students' learning (Garfield, 1995); instructors must continue to explore how changes to one assessment or learning activity impact the entire course design (Fink, 2003). Changes could be made to *all* of the above, and students may still walk away from the course with their initial perceptions unchanged. As one of the goals in statistics education should continue to be increased statistical literacy (Gal & Garfield, 1997), continued research in statistics education should focus on which aspects of the course help students and which do not. This also means we as statistics education researchers and statistics educators need to continue to understand what, exactly, "relevance" means for our students and their learning and understanding of introductory statistics.

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Appendix A

Best (2001), Chapter One Discussion

(1) What, in your group's opinion, is the main point of Chapter One?

(2) Examine each of your group members' news clips using your response to question 1 as a guide. What is your group's opinion of each clip?

Clip Citation	**Opinion**

Appendix B

Best (2001), Chapter Three Discussion

Using one of your group members' statistics, imagine it falls into the "wrong hands." How might someone mutate this statistic? Write a 300-word "Letter to the Editor" as the person mutating your statistic, arguing for the immediate dismissal of the person in charge (e.g., if you are working with a statistic created by a teacher, argue for the dismissal of the superintendent of the district).

Appendix C: Relevance Survey

At this point in time, circle below how relevant you believe statistics are to your *personal life*:

1	2	3	4	5
Not at all Relevant				Very Relevant

Please describe why you chose that value:

On last day survey, question added for next cycle:

Do you think your rating changed from the first day of class?

O	O	O
Yes, it went up	Yes, it went down	No, it stayed the same

At this point in time, circle below how relevant you believe statistics are to your *professional life*:

1	2	3	4	5
Not at all Relevant				Very Relevant

Please describe why you chose that value:

On last day survey, question added for next cycle:

Do you think your rating changed from the first day of class?

O	O	O
Yes, it went up	Yes, it went down	No, it stayed the same

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