sonal ads as a database can develop ways to emphasize his or her own choice of any conventional statistic. Furthermore, concerning specific content, I restricted attention to age information in ads. However, a glance at any personals section in the newspaper will reveal many other interesting types of ad content. Advertisers frequently touch on matters of appearance, financial resources, personality, good (and bad) habits, and religiosity, among other things. The enterprising instructor will discover many opportunities for various quantitative and qualitative research applications to help students learn statistical concepts.

References


Note

Send correspondence and requests for copies of the personal ad sets, classroom forms, and the attitudinal and statistical questionnaires to D. W. Rajecki, Department of Psychology, LD124, IUPUI, 402 North Blackford Street, Indianapolis, IN 46202-3275; e-mail: drajecki@iupui.edu.

A Sweet Tasting Demonstration of Random Occurrences

Andrew N. Christopher
Anderson College

Pam Marek
St. Michael's College

We describe an active learning demonstration using LifeSavers® candy to illustrate the phenomenon of random occurrences. We provide each student with a roll of Five Flavor LifeSavers. In a dyad, students take turns trying to guess the flavor of candy in their mouths when deprived of the senses of sight and smell. Because there are 5 flavors of candy, students have a 20% chance of randomly guessing the correct flavor. In a sample of 49 undergraduates, student performance reflects this chance guessing rate. Students report that this demonstration was informative and enjoyable. Exam results indicate that students mastered the concept of random occurrences. We discuss other uses of this demonstration.

Understanding of chance or random occurrences is one facet of critical thinking that underlies interpretation of scientific experimentation. On a broader scale, misperception of randomness is one of several difficulties in statistical or probabilistic thinking that may explain how people know what is not so (Gilovich, 1991). Specific descriptions of the misperceptions of randomness and related biases in statistical thinking (e.g., illusory correlation or the gambler’s fallacy) are highlighted in only about half of the Introductory Psychology texts published between 1995 and 1997 (Griggs, Jackson, Marek, & Christopher, 1998). How might instructors introduce this important topic in a manner that will engage students who may otherwise consider statistics a somewhat distasteful subject area?

Concrete, hands-on experiences may help increase understanding of more abstract statistical concepts (Brown & Kane, 1988). To this end, Dyck and Gee (1998) discussed how teach-
ers can have students use M&M’s® candy to create an actual sampling distribution of the mean for a designated candy color. Similarly, Hull and Hull (2000) flavored their presentation of subjective, empirical, and theoretical probabilities by distributing a bag of plain M&Ms to each student and then actively involving students in estimations and statistical comparisons of the probability of finding each of six M&Ms’ colors. In this article, we describe a demonstration in which students learn about probability by attempting to guess the flavor of a LifeSavers® candy. Because class discussion subsequent to the activity can potentially extend in multiple directions, we consider how to incorporate this sweet tasting demonstration into a range of psychology courses.

Conducting the Demonstration

Materials and Preparation

LifeSavers, and possibly small sandwich bags, are the only materials required for this demonstration. The choice of individual roles or larger bags of LifeSavers depends on class size and instructor preference. One alternative is to Macquire one roll of Five Flavor LifeSavers for each student. Each roll contains the following flavors: cherry, lemon, lime, orange, and pineapple. Another alternative is to buy large Five Flavor packages of individually wrapped LifeSavers (approximately one package for every five students) and a sufficient number of small sandwich bags to enable pairs of students to share a bag. To prepare for the activity, the teacher should place two LifeSavers of each flavor in a sandwich bag. A third alternative is to “stock up” on economy sized bags of the candy sold around the Halloween and Easter holidays.

Procedure

Announce that the class will be playing a guessing game with LifeSavers’ flavors. Write the names of the five flavors on the board (or use an overhead transparency prepared in advance). Ask students to form dyads (if there is an odd number of students, the teacher can participate also). Indicate that the object of the game is to guess the flavor of a LifeSaver in one’s mouth without using the senses of sight or smell. After reminding students again about the five available flavors, distribute a roll of LifeSavers to each student (or a sandwich bag of LifeSavers to each dyad). Emphasize that students should not open the roll (or the bag) until the instructor says “open.”

Students in each pair take turns eating a LifeSaver and guessing its flavor. Those guessing first close their eyes and tightly hold their noses. The partners of these students then open the roll of candy (or remove one piece from the sandwich bag) and place one unwrapped LifeSaver in their partners’ free hand. The students designated to guess first then eat the LifeSaver, attempt to determine its flavor, and report the flavor to their partners. Students then reverse roles and repeat the process.

After all students have had an opportunity to guess the flavor, ask those who correctly identified the flavor to raise their hands. Count the number of correct identifications and convert this number into a percentage. (We have found that many students want a second chance to do this demonstration. Depending on time constraints, the teacher may allow students to repeat the process. If the process is repeated, we suggest separate hand counts, one after each time both students have completed the Procedure.) In a class of 35 students, this demonstration required about 10 min of class time to explain and execute.

Alternative Procedures

In larger classes, if the mechanics of the taste test approach appear cumbersome, instructors may opt for simpler, albeit less engaging, alternatives. In one alternative procedure, materials are limited to a single roll of LifeSavers. After indicating the five flavor designations, the instructor displays an unopened roll of LifeSavers, then asks all students to write down the name of the flavor they expect to appear first when the roll is opened. The instructor then recruits a student volunteer to open the roll, announce the first flavor to the class, and assist in tallying the count of students who have guessed correctly. Because this revised Procedure does not involve eating candy, a particularly appealing aspect of the activity, from a student perspective, is lost. Thus, we suggest a compromise—an alternative Procedure in which students guess the flavor they expect to appear, but also have an opportunity to eat the LifeSavers. In this scenario, the instructor distributes one unopened roll of LifeSavers to a group of five students, asks each student to guess the flavor that will first appear when the roll is opened, and appoints one individual in each group to tally the number of correct answers. The instructor then cumulates the group responses and announces the results to the class. During the subsequent discussion, students in each group may share the LifeSavers used in the demonstration. Although this alternative Procedure may be attractive for larger classes, we have not actually used it ourselves, and thus cannot comment on its effectiveness.

Demonstration Results and Classroom Discussion

Results

Because this exercise restricts the use of both vision and smell (needed in combination with taste to detect flavor), it should not be possible for students to detect the flavor of candy in their mouths. Yet, about 20% of the students were still able to guess the correct flavor. Of the 49 students participating in this demonstration (35 in Introductory Psychology and 14 in Research Methods), 10 (20.41%) correctly guessed the flavor of LifeSaver in their mouths.

After counting the number of students who correctly identified the flavor of LifeSaver (or who correctly guessed the first flavor in a roll), begin a discussion of the demonstration results. Ask why certain students correctly identified the flavor. We have found that very few students specifically noted that given five flavors from which to choose, approximately

Vol. 29, No. 2, 2002

123
20% would guess correctly by chance. Instead, students who correctly identified the flavor of candy tended to emphasize their "superior taste buds." Other students mentioned ways that these students may have cheated, leading to a discussion of control. In fact, the idea of having partners actually record responses in writing stemmed from student suggestions. Additionally, to ensure total restriction of sight and smell, students suggested the use of blindfolds and nose clips.

**Applications and Potential Topics for Discussion**

When students understand how probabilities affected the results of this demonstration, the subsequent direction of class discussion depends on course context. For example, in Research Methods courses, the instructor might extend discussion to hypothesis testing in research, encompassing such issues as what a \( p \) value actually measures. Depending on class level in the curriculum, teachers can expand coverage to encompass how the concept of probability relates to random sampling. If two students shared a single sandwich bag of LifeSavers, probes concerning differences between sampling with and without replacement are appropriate. Why, for example, does the theoretical probability for a correct guess differ for the first and second taste testers in a dyad?  

In courses other than Research Methods, different avenues of discussion are suitable. In Introductory Psychology, teachers may link the demonstration to sensation and perception (e.g., sensory interaction), thinking (e.g., misperceptions of randomness), or the scientific attitude (e.g., the role of chance factors in assessing controversial claims related to extrasensory perception). In Cognitive Psychology, the demonstration can be used to complement material on decision making, such as how the representativeness heuristic contributes to misperceptions of randomness.

**Evaluation of the Démonstration**

We asked students (\( N = 49 \)) to assess this demonstration by responding to five items taken from Hull and Hull (2000) on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Students reported that this demonstration was useful (\( M = 6.12, SD = 1.34 \)), helpful in understanding random occurrences (\( M = 6.00, SD = 0.91 \)), easier to learn from than from descriptions in the book (\( M = 6.34, SD = 0.67 \)), a good supplement to the lecture (\( M = 5.54, SD = 1.95 \)), and suitable for use in future classes (\( M = 6.55, SD = 0.82 \)). None of these ratings differed significantly between the Introductory Psychology and Research Methods students.

We also evaluated the exercise by explaining responses to related exam questions that we gave students approximately 1 to 2 weeks after the demonstration. We asked students in both the Introductory Psychology and Research Methods courses the following two multiple-choice questions, adapted from Brink (1998):

1. In a series of six coin flips, which of the following sequences of heads (H) and tails (T) is most likely to occur?  
   a) HHTHTT  
   b) HHHTTT  
   c) TTTZTT  
   d) All of the above are equally likely to occur.*

2. The King James version of the Bible was completed when William Shakespeare was 46 years old. In Psalm 46 of this translation, the forty-sixth word is "shaké," and the forty-sixth word from the end is "spare." Before concluding that the biblical translators were trying to be humorous with these word placements, you would be best advised to realize the dangers of  
   a) explaining events in hindsight.  
   b) generalizing from small samples.  
   c) perceiving order in coincidental events.*  
   d) assuming people share your opinions.  
*Indicates correct answer.

Of the 35 Introductory Psychology students, 28 correctly answered the first question, and 32 correctly answered the second question. Of the 14 Research Methods students, 12 correctly answered the first question, and all correctly answered the second question. Given the applied nature of these questions, these correct response rates suggest that this demonstration encourages students to consider the role of randomness in novel situations.

We acknowledge the absence of a control group that did not experience the demonstration. Furthermore, the fact that we assigned reading on this topic and lectured on it after doing the demonstration may have further enhanced performance on these exam questions. However, the level of correctness responses hints that the demonstration indeed possesses pedagogical value.

In addition to the two multiple-choice questions, we asked the Research Methods students the following short-answer question: "In class, we did an exercise that required you to identify a flavor of candy when your sight and smell (essential for detecting flavor) were restricted. Explain how approximately 20% of the class managed to identify the flavor." AU 14 students in the class articulated how chance influenced the results of this exercise.

**Conclusions**

Enthusiastic student feedback and accuracy of students' responses to exam questions indicate that the LifeSavers demonstration is an effective means to explicate how random
occurrences can be perceived as orderly. The demonstration tastefully offers an enjoyable presentation of the concept of probability and discussion is fruitfully channeled into cher areas related to the scientific attitude, sensation and perception, and biases in decision making. Thus, the activity appears to be a useful addition to a variety of psychology courses at different levels of the curriculum.

References


Attending Step Meetings As a Course Requirement: A Preliminary Investigation

Ann R. Bristow
Jennifer Provost
Kristin Morton
Frostburg State University

Students in Drugs and Behavior courses evaluated their experiences of attending 12-step meetings (e.g., Alcoholics Anonymous). We describe the parameters of this course requirement and offer suggestions for implementation. As hypothesized, students reported that attendance at 12-step meetings increased their understanding of addiction treatment and was relevant to the objectives of a Drugs and Behavior course. These 2 dimensions were also positively correlated with students' reports of comfort attending meetings. Students wrote reaction papers addressing positive and negative feelings and issues regarding 12-step meeting attendance. We provide examples of these comments, as well as students' suggestions for increasing comfort when attending meetings, to guide instructors who might want to assign a similar activity.

Addictions specialists advocate that people unfamiliar with 12-step meetings, and who want to work in addictions treatment, should attend several meetings (e.g., Grutchfield, 1986; Zweben, 1995). Meetings are conducted through the self-help organization known as Alcoholics Anonymous (AA) and its various offshoots such as Narcotics Anonymous (NA) and Al-Anon.

The first author required students in Drugs and Behavior classes to attend 12-step meetings. Activity goals were to (a) hear first-person accounts of experiences with addiction, (b) deconstruct stereotypes of addicted people (e.g., "skid row" Alcoholics), and (c) observe a common model of addiction recovery. This article describes the course requirement, presents students' evaluations, and provides suggestions for implementing the requirement to minimize disruption of meeting fellowships and to enhance student learning. We hypothesized that students would report that meeting attendance increased addiction treatment understanding and was relevant to the Drugs and Behavior course objectives.

Notes

1. Para Marek is now at Anderson College.
2. We thank Cynthia S. Koenig and Jason R. Jones for their helpful comments on earlier drafts of this article.
3. Send correspondence to Andrew N. Christopher, who is now at the Department of Psychology, Albion College, Albion, MI 49224; e-mail:achristopher@albion.edu.