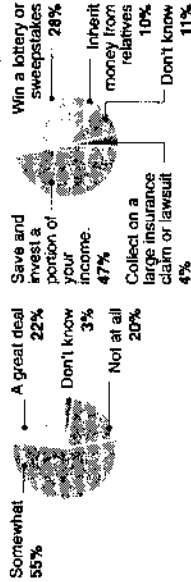


# Lottery seen as

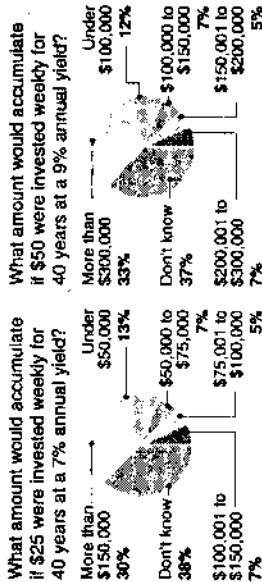
## Savings survey

A recent survey shows that many Americans feel that, despite a boom in the American economy, a monetary windfall is their only chance of acquiring wealth.

To what extent have you personally experienced the benefits of the American economic boom?

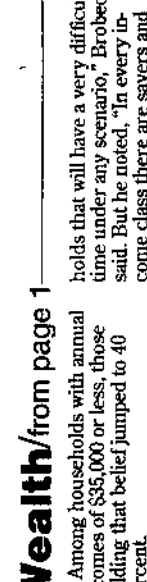


What is your best chance to obtain half a million dollars or more in your own lifetime?



Many of those surveyed also hold misconceptions about how profitable even small investments can be.

What amount would accumulate if \$25 were invested weekly for 40 years at a 7% annual yield?



Note: Because of rounding, sums may exceed 100 percent.

Source: The Consumer Federation of America, Primmica

AP/Wide World, J. Castellan

# best bet to gain wealth

**Survey results:** One-fourth of Americans don't see virtue of saving

WASHINGTON (AP) — One-quarter of Americans believe their best chance to build wealth for retirement is by playing the lottery, a survey says. Those living paycheck to paycheck are even more likely to feel that way.

Misconceptions about how small amounts of money can grow keep millions of people from taking the steps that could greatly improve their lot, say sponsors of the survey released Thursday — the Consumer Federation of America and the financial services firm Primmica.

"If Americans understood that their chances of winning a big lottery jackpot were 10 to 20 million to one but that they could accumulate hundreds of thousands of dollars through regular saving, more families would put \$50 away rather than spending it on gambling or unneeded consumption," said Primmica Chairman Joseph Purneri.

Invested for 40 years at a 9 percent annual yield, \$50 a week would add up to \$1,025,853.

Stephen Brobeck, the consumer group's executive director, said banks and brokerage firms must take some of the blame for the fact that many Americans don't realize there are ways to invest profitably even small amounts of money, such as in savings bonds or mutual funds.

"I don't think they've done an adequate job in publicizing those products to the low- and middle-income households," Brobeck said. "There are decent savings options out there for any household."

The poll indicated 28 percent of Americans believe winning a lottery or sweepstakes is their "best chance to obtain a half a million dollars or more in your lifetime."

BOZEMAN  
CHARONVILLE  
10/29/00

# Texas study shows 'social promotion' hurts students

Gannett News Service

WASHINGTON — A major study of Texas children shows that struggling students held back a grade score higher in later years than students "socially promoted" to the next grade.

The study, sponsored by the Texas Education Agency, may change the debate about social promotion policies. Most previous studies, which are dated and relied on smaller samples, concluded holding children back a grade did more harm than good.

"What this study tells us is that social promotion is not necessarily all that good," said one of the authors, Gary Dworkin from the University of Houston.

For children held back a grade, Dworkin said, "Retention is not academically bad."

The study tracks 35,000 Texas students who failed the state assessment in third grade. Those "socially promoted" to fourth grade had slightly higher scores than those who had to repeat the grade. But retained students caught up quickly, and by fifth grade were outscoring those who had been promoted.

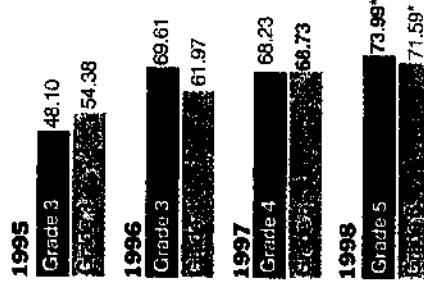
The study, which has been circulating among Texas education officials, was released at the request of Gannett News Service.

Adding importance to the study is its size, currency and the fact so many poor and minority children were involved — the very children most likely to be held back a grade.

## Children benefit from repeating a grade

A Texas study tracked 35,000 children who failed the state assessment in third grade. Some were retained in grade; others were promoted. Figures in bold show fifth grade scores: retained students achieved a passing grade of above 70; students who had been promoted missed a passing score by nearly two points.

■ Retained  
■ Promoted



\*Average score indicates passing the Texas Assessment of Academic Skills  
Source: University of Houston

Laune Trifieldt, Gannett News Service

## Wealth from page 1

Among households with annual incomes of \$35,000 or less, those holding that belief jumped to 40 percent.

Overall, fewer than half — 47 percent — of all those surveyed said saving and investing some of their income was the most reliable route to wealth.

People were also asked how much \$25 invested weekly for 40 years at a 7 percent annual yield would amount to. Fewer than a third guessed over \$150,000. The correct answer is \$286,640.

A series of similar questions found that younger and lower-income Americans, along with women, tend to most undervalue how savings can add up.

But that \$286,640 is still not the half-million dollars the survey asked about.

"There are a number of house-

What Students Expect to Major In

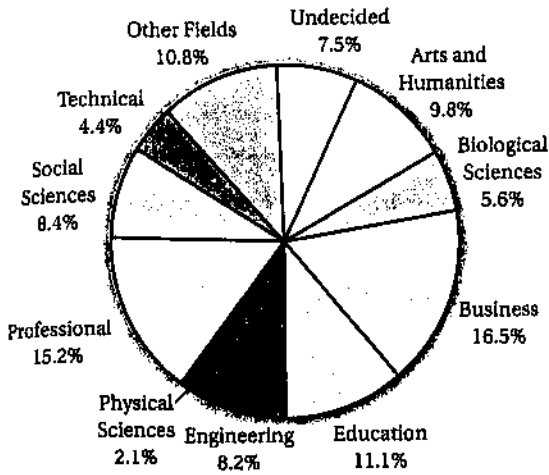


FIGURE 5.7 Planned major areas for first-year college students, 1999. SOURCE: *Chronicle of Higher Education*, January 29, 1999, p. A48.

What Students Expect to Major In

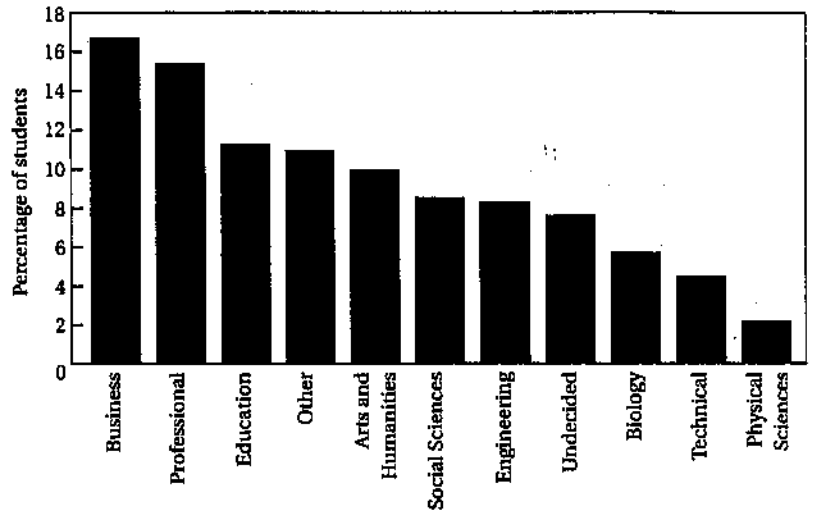
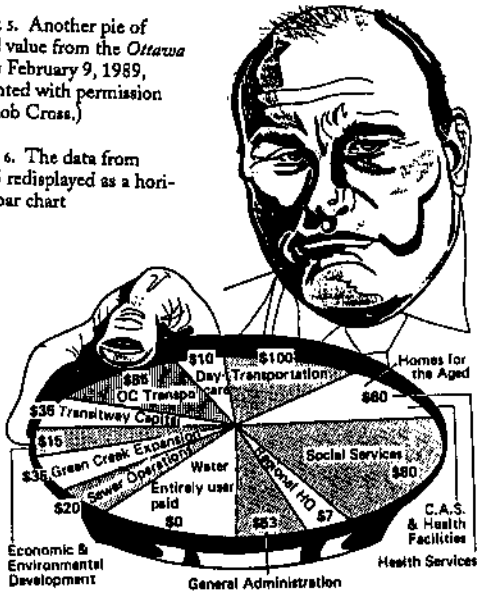


FIGURE 5.8 Bar graph for the data in Figure 5.7.

FIGURE 5. Another pie of limited value from the *Ottawa Citizen* February 9, 1989, (Reprinted with permission from Rob Cross.)

FIGURE 6. The data from figure 5 redisplayed as a horizontal bar chart



Category of Expenditure

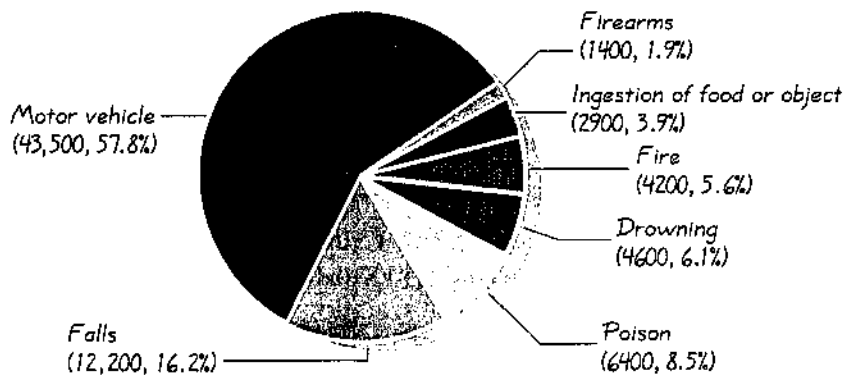
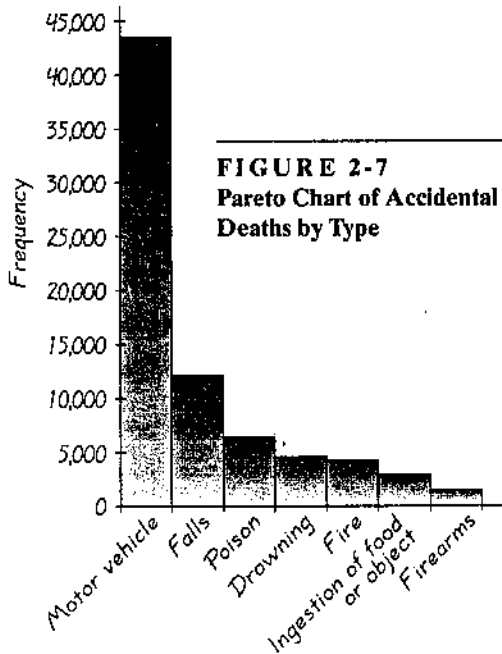
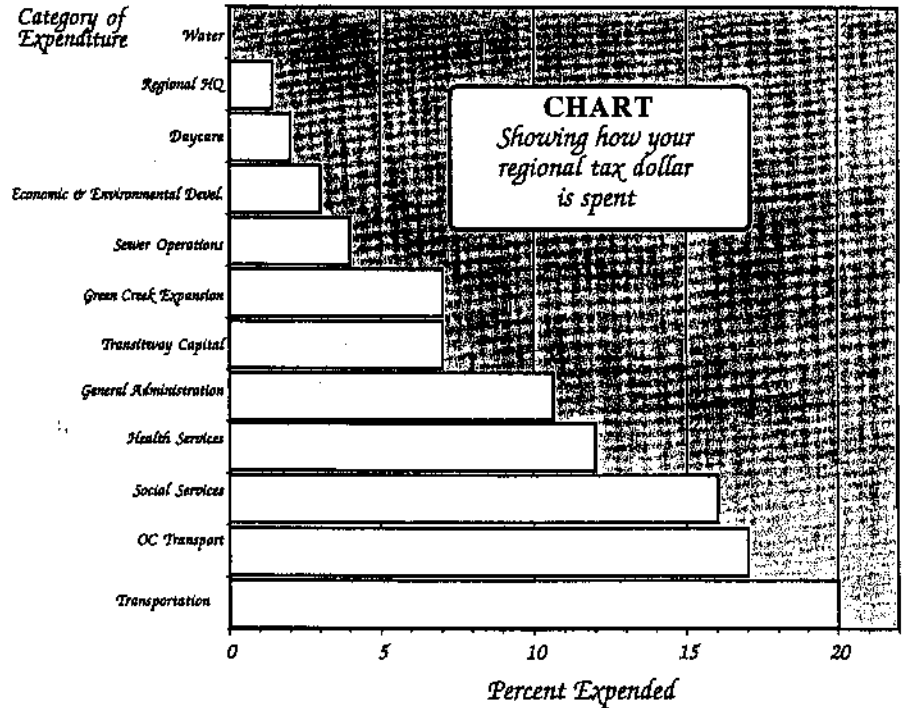


FIGURE 2-8  
Pie Chart of Accidental Deaths by Type

Figure 1 *Misleading:*

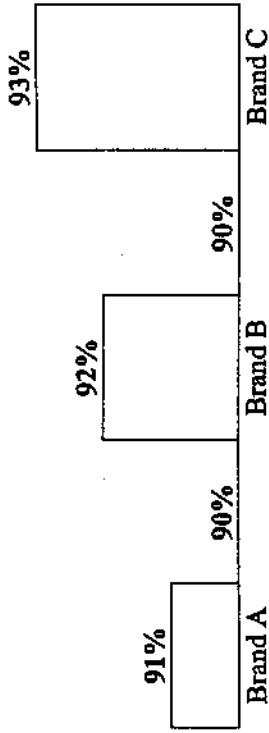
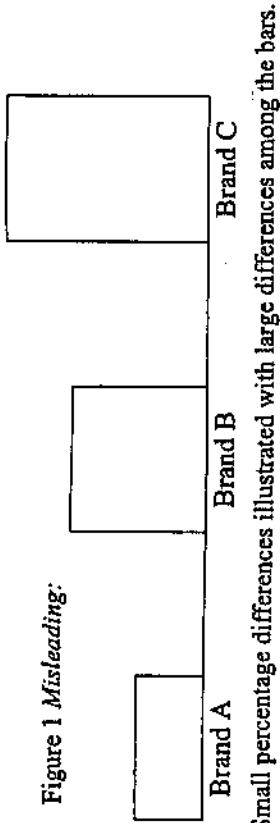


Figure 2 *Percentages for Figure 1 shown in bold. Still misleading:*  
Small percentage differences illustrated with large differences among the bars.

To avoid such misleading drawings, they should begin at a base of zero,

Figure 3 *Correct:*

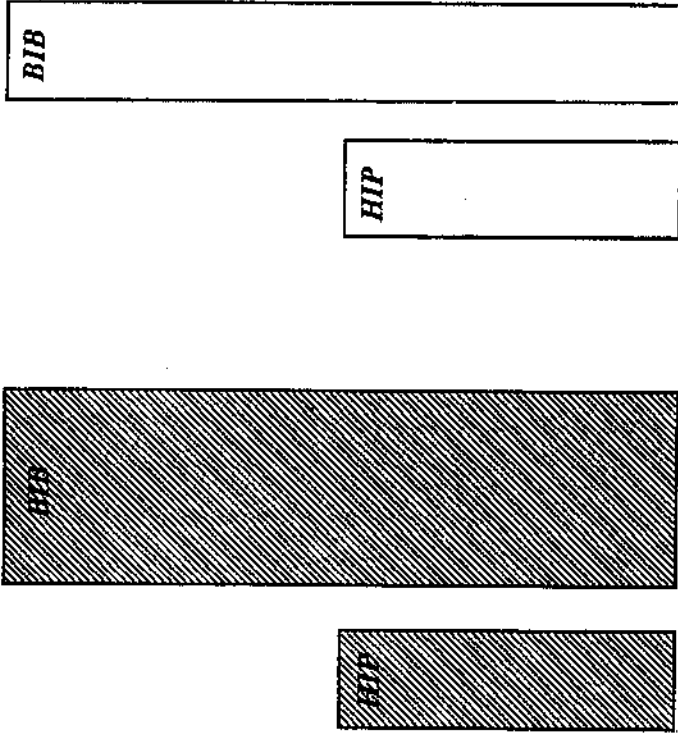
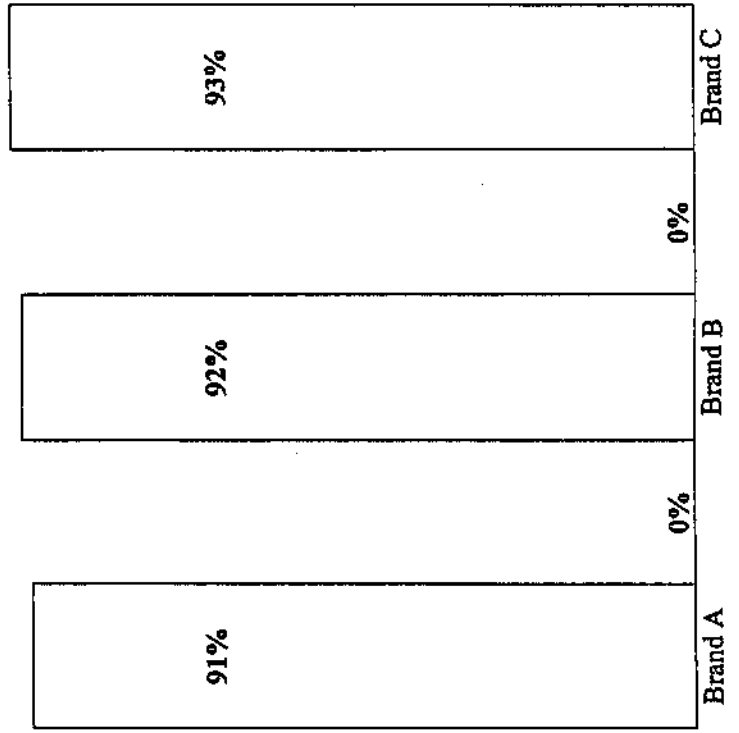


Figure 1

*Misleading:*

Twice as tall and twice as wide.

Figure 2

*Correct:*

Twice as tall only creates a figure with twice the area.

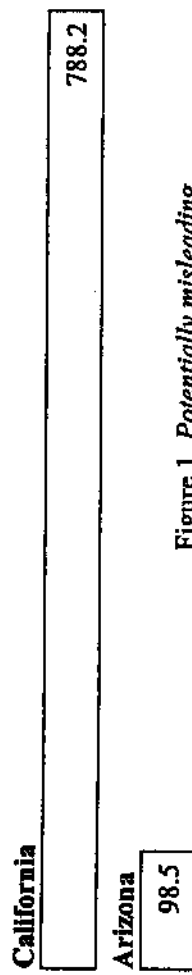


Figure 1 *Potentially misleading*  
Gallons of bottled water consumed (in millions)

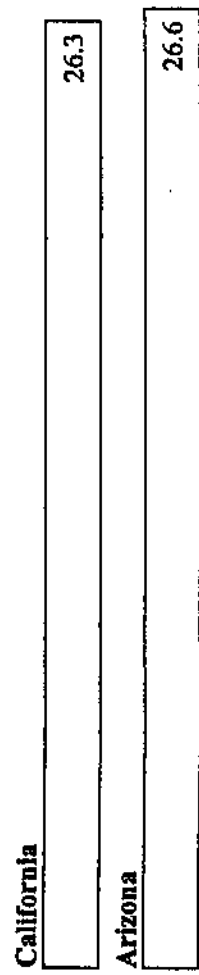
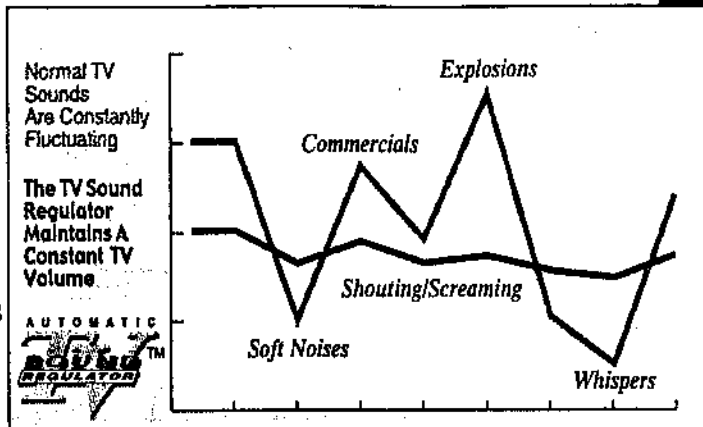


Figure 2 *Correct*  
Gallons of bottled water consumed *per capita* (per person)

# Put An End To Loud Annoying TV Commercials

INTERNATIONAL  
**ICS CONTROL SYSTEMS**

Now there's an easy way to stop blaring commercials and variations in channel volumes! It seems like the networks adjust the volume so the commercials are almost twice as loud as the program. All you need is the TV Sound Regulator™. Simply plug it into the back of your TV, set your desired volume and presto! It automatically lowers commercial volumes, amplifies low sound levels and maintains a constant volume to help keep you sane. Don't disturb the peace during late night viewing when whispers turn into explosions. 1-year Limited Warranty.  
**Mfr. Sugg. Retail \$59.95**  
**HEARTLAND AMERICA PRICE**  
Item No. PX-6931



**\$49<sup>99</sup>**



**NEW CAPLETS**

## Echinacea

Standardized Herbal Extract

Animal and laboratory studies show that echinacea stimulates the body's own defenses.\*

American standards for herbal products have not yet been established. The herb, echinacea, is listed in the British Herbal Pharmacopela. Your Life® Echinacea has been standardized to 4% phenolic compounds using state of the art liquid extraction to eliminate impurities and maximize beneficial ingredients. Each caplet is phytograph™† tested to guarantee the delivery of key phyto-nutrients in every product.

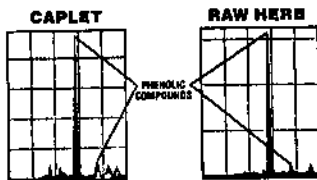
\*These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.

List No. YA30090CWA

### Phytograph™

Phytograph™ is our "fingerprint" technology using High Performance Liquid Chromatography (HPLC) to compare the phyto-nutrient content of Your Life® herbal extract to whole herbs.

### Phytograph™ of Your Life® Echinacea Caplet



HPLC chromatograms confirm the presence of key phyto-nutrients found in the raw herb which have been standardized for optimum concentration in Your Life® Echinacea Caplets

## Echinacea

Standardized Herbal Extract

### Immune System

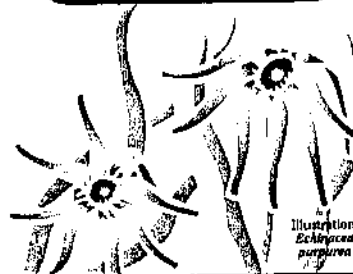


Illustration: Echinacea purpurea

**125 MG CONCENTRATE DIETARY SUPPLEMENT**

**50 CAPLETS**

### Nutrition Facts

Serving Size 1 Caplet

Each Caplet Contains	% DV
Echinacea Extract ( <i>Echinacea angustifolia</i> & <i>Echinacea purpurea</i> ) 125 mg (Standardized to 4% Phenolic Compounds)	**

\*\*Daily Value not established.

**INGREDIENTS:** Calcium Carbonate, Echinacea Extract, Cellulose, Maltodextrin, Hydroxypropyl Methylcellulose, Silicon Dioxide, Polyethylene Glycol 3350, Croscarmellose Sodium, Hydroxypropyl Cellulose, Red 40 Lake, Blue 2 Lake, Pharmaceutical Glaze, Croscopidone, Magnesium Stearate, Polysorbate 80, Titanium Dioxide.

©Your Life, a registered trademark of Leiner Health Products Inc. Carson, California 90745 U.S.A.

**Suggested use:** Take one caplet two times daily with a full glass of water, preferably after a meal.

Keep in a cool dry place.

**NOTICE:** Herbs have a distinct natural odor.

Made with standardized extract echinacea to a level of 4% phenolic compounds.

Our understanding of perceptual distortions like these grew out of the experiments and formal analyses conducted by gestalt psychologists. Much of this work was done in the late nineteenth century in Wundt's laboratory in Leipzig, where this particular distortion was sufficiently well known to have its own name. Roughly translated from the German, it is called "the old goosing up the effect by squaring the eyeball trick."

### Perceptual Distortions

Many graphics are drawn in a way that distorts our perception of them. Figure 5.21 shows one of the most common types of distortion. The dollar-shaped bars are used to represent the declining value of the dollar over time. Although it is the *length* of each bar that represents the data, our eyes tend to focus on the *areas* of the bars. For example, the bottom bar is supposed to show that a dollar in 2000 was worth only 48% as much as a dollar in 1980. Its length is indeed 48% that of the top bar, but its area is much smaller in comparison (about 23% of the area of the top bar). This gives the perception that the value of the dollar shrank even more than it really did. (German researchers in the latter part of the 19th century studied many types of graphics. The type of distortion shown in Figure 5.21 was so common that they gave it its own name, which translates roughly as "the old goosing up the effect by squaring the eyeball trick.")

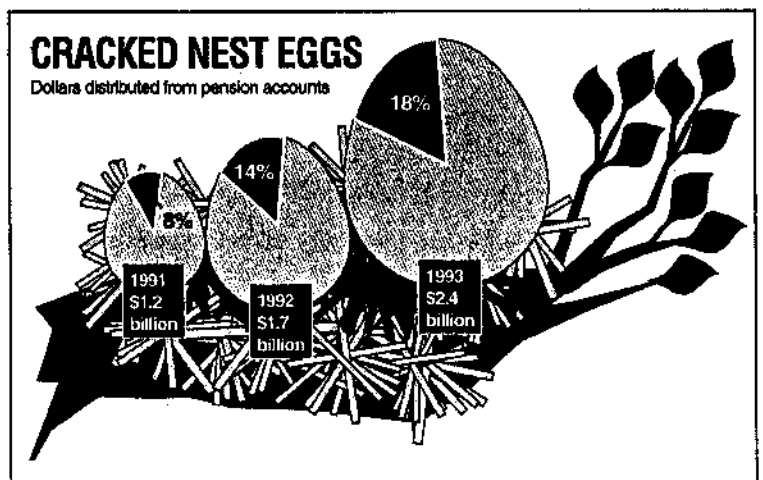
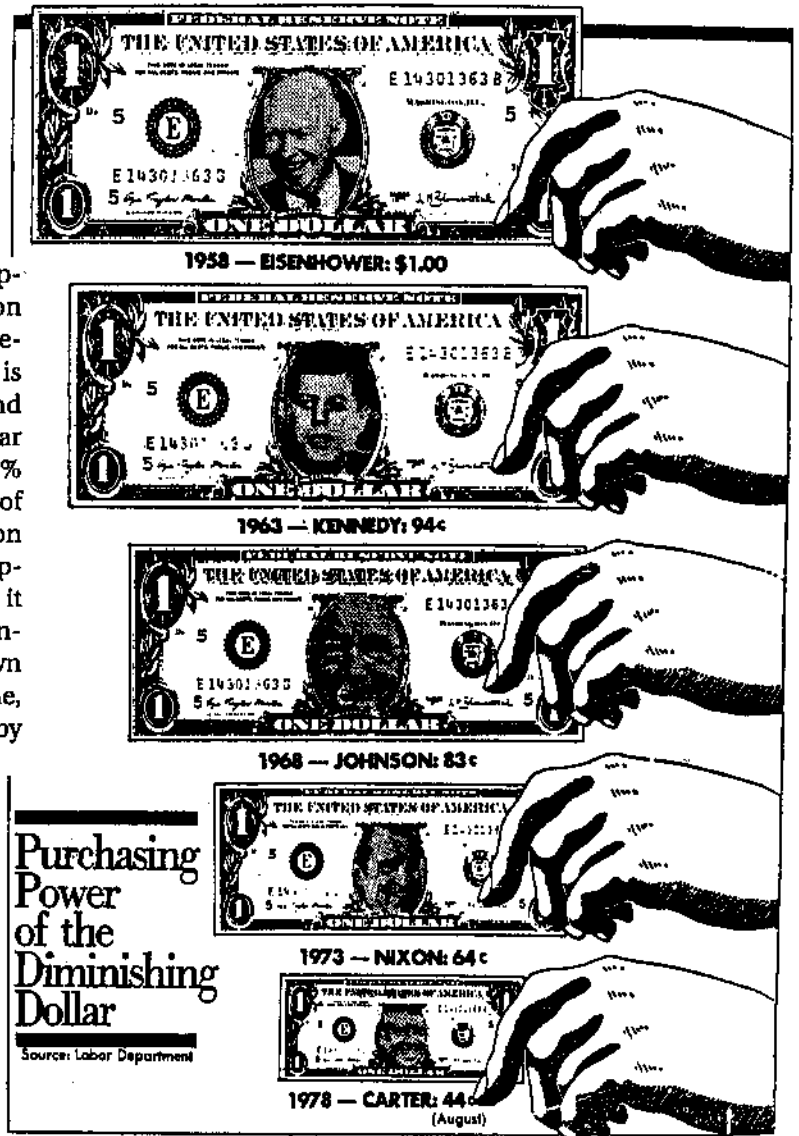
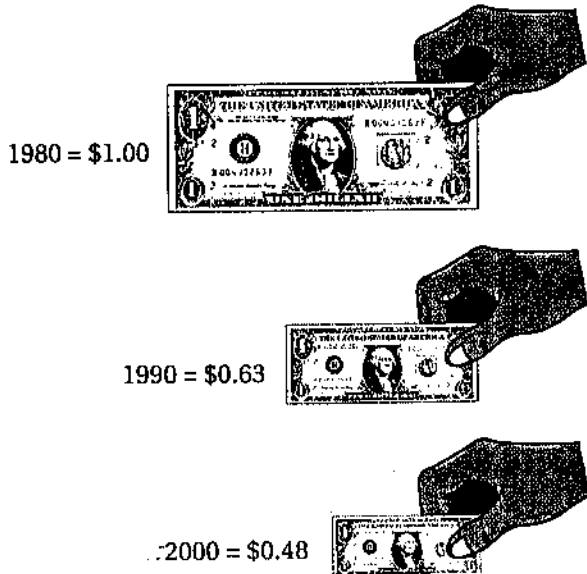


FIGURE 5.21 The lengths of the dollars are proportional to their spending power, but our eyes are drawn to the areas, which decline more than the lengths.

# DISTORTING THE SCALE OF THE DATA

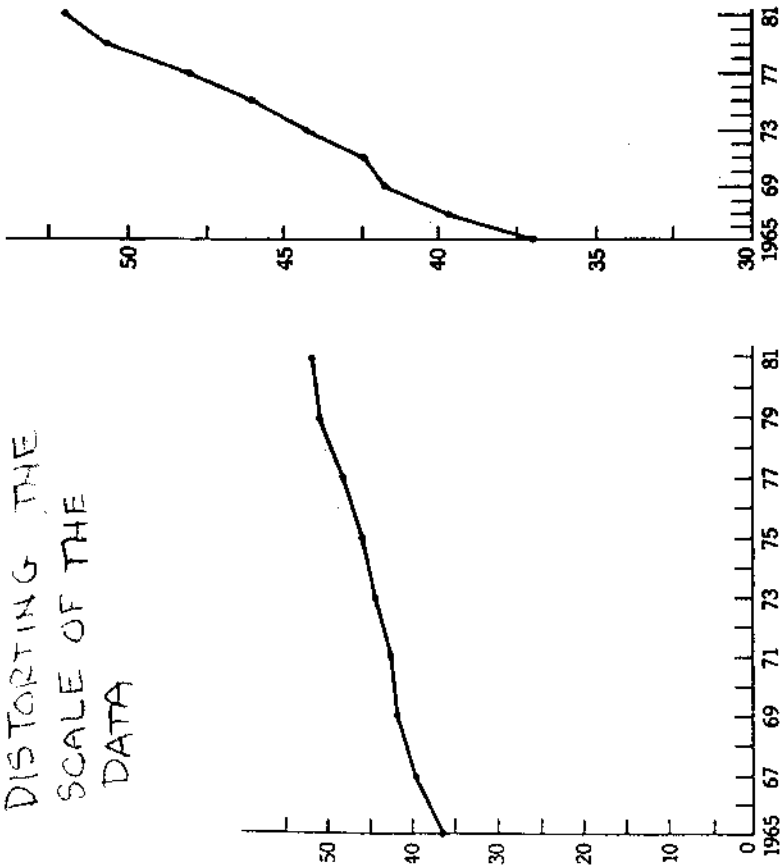


Figure 4-2. Two line graphs of the same data. Female labor force as percent of female population age 16 and over. [From *Statistical Abstract of the United States, 1973 and 1982-1983*.]

Even greater distortion can be accomplished by using volumes rather than areas and by playing around with the scale and origin. In figure 19 the volumetric increase in beer sales is a whopping 38,200%, whereas the actual increase is a respectable 29%, for a lie factor of 131,724%. A more accurate depiction is shown in figure 20.

In discussing these kinds of distortions, people who prepare graphics for the media (mostly newspapers) had two excuses. They (1) "just wanted to show that the dollar was shrinking," or (2) explained that "after all, the correct amount was written just below the dollar."

I guess excuse number two means that they felt that it is OK to lie in one place if you tell the truth in another. Excuse number one reflects a limited understanding of the full power of what a number represents. Numbers can be ordered, certainly; 14 is greater than 3. But the real power of numbers is in their magnitudes. Hearing that your salary is going up next year is good news, but who could hear that without wanting to ask "How much?"

# U.S. Beer Sales and Schlitz's Share

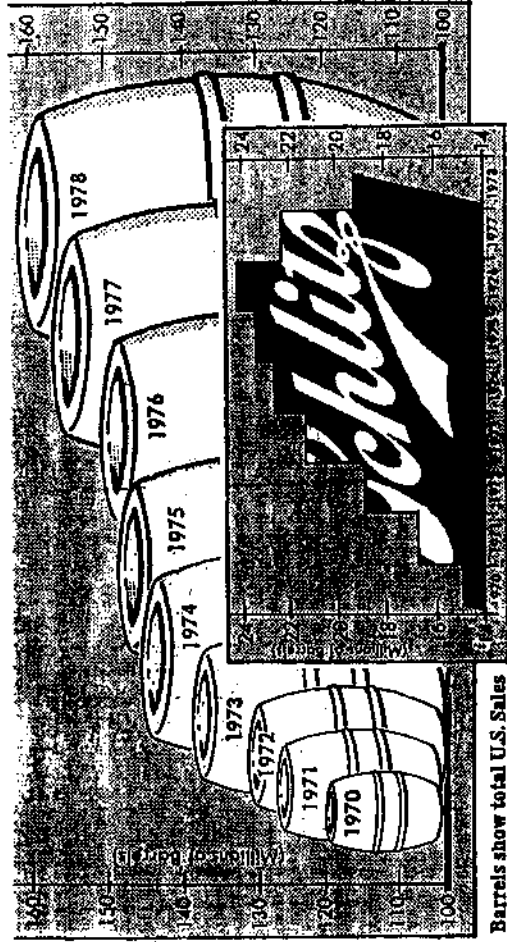
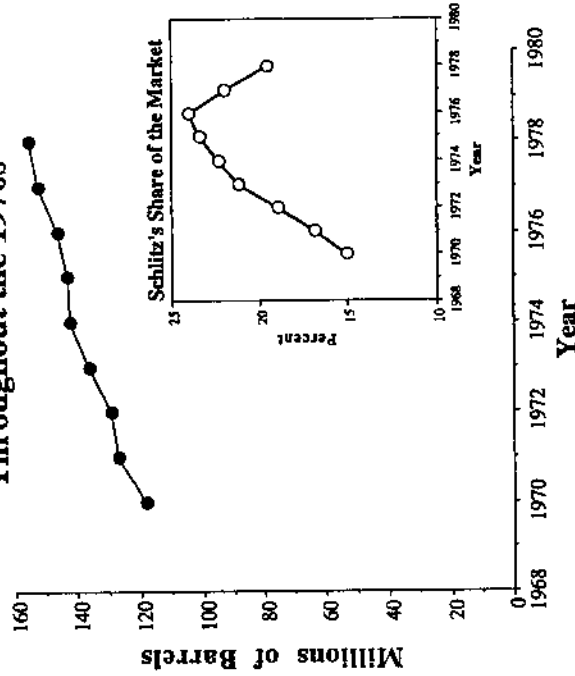


FIGURE 19. Cubing the visual effect and choosing the origin to yield a near record lie factor of over 131,000% (from the *Washington Post*).

FIGURE 20. Data from figure 19 redone without tricks (from Wainer, 1980).

# U.S. Beer Sales Grew Steadily Throughout the 1970s



# Roaring Fork Transit

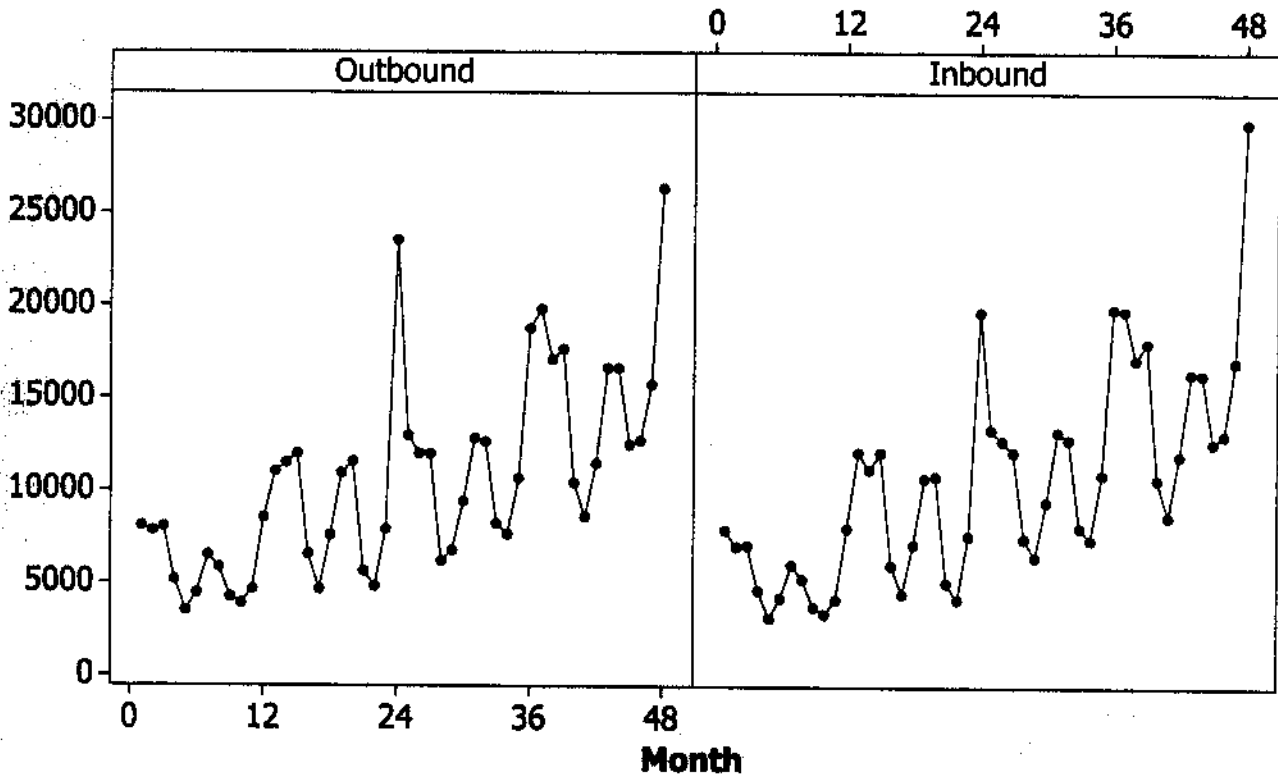
The Roaring Fork Transit Agency (RFTA) operates a multi-county bus system based in Aspen, Colorado, a mountain community increasingly known as an upscale resort. The Roaring Fork Valley (named for the Roaring Fork River, which flows from the mountains above Aspen into the Colorado River at Glenwood Springs, some 50 miles away) grew substantially from 1987 to 1990. Combined with lack of available affordable housing (particularly in the winter ski season), increased traffic on state highway 82 ("Killer 82," the only highway into Aspen in winter), and rising gasoline prices (\$1.83 per gallon in January 1991) the growth has led to more passengers on the "downvalley" routes from Aspen to El Jebel and Carbondale. At times, RFTA has had trouble meeting demand for its services on this route.

Monthly ridership figures (total riders) for OUTBOUND (from Aspen in the direction of Carbondale/El Jebel) and INBOUND (from Carbondale/El Jebel to Aspen) routes are given in the data below for 1987-1990 (months are indicated by the variable MONTH, where MONTH=1 for January 1987).

RFTA management must make plans, including choices about buying new equipment, leasing extra buses, hiring more drivers, etc. for the next few years. Prepare a presentation highlighting any trends or patterns in the data you think RFTA management should know about. The data are available in the file ROARING.MTW

MONTH	OUTBOUND	INBOUND	MONTH	OUTBOUND	INBOUND
1	8078	7885	25	12991	13353
2	7816	7004	26	11999	12752
3	8025	7058	27	11986	12151
4	5170	4635	28	6206	7472
5	3534	3130	29	6787	6481
6	4449	4242	30	9432	9463
7	6508	6046	31	12826	13240
8	5849	5250	32	12626	12826
9	4262	3759	33	8223	8059
10	3913	3377	34	7647	7414
11	4666	4174	35	10652	10941
12	8534	7995	36	18767	19889
13	11028	12114	37	19815	19747
14	11517	11190	38	17078	17124
15	12012	12109	39	17662	18030
16	6577	6030	40	10429	10670
17	4677	4477	41	8595	8672
18	7583	7144	42	11478	11968
19	10947	10720	43	16635	16394
20	11590	10823	44	16638	16336
21	5652	5086	45	12500	12644
22	4829	4164	46	12725	13088
23	7918	7608	47	15745	17011
24	23536	19697	48	26362	29890

### Scatterplot of Outbound, Inbound vs Month



### Scatterplot of Outbound vs Month in Year

