

Appendix Two

Second Exploratory Study Interview Tasks

A2.1 First Interview Tasks

1. On the "Money" programme on TV1 on Friday 28 April 1995 the advice for playing LOTTO was to spread the numbers you chose. Comment on this advice.
2. Every year in New Zealand approximately seven children are born with a limb missing. Last year the children born with this abnormality were located in New Zealand as shown on the map (Fig. A2.1). What do you think about this situation?

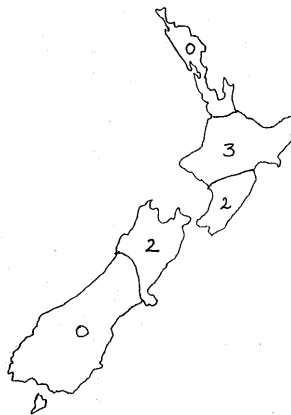


Figure A2.1 Map Question

3. In a firm at Wellington the management was concerned at the number of errors that office staff were making in transactions. The four office staff were audited every day over a month and the following box-and-whisker plots were obtained (Fig. A2.2). If you were the manager and had been presented with this graph what would you think?

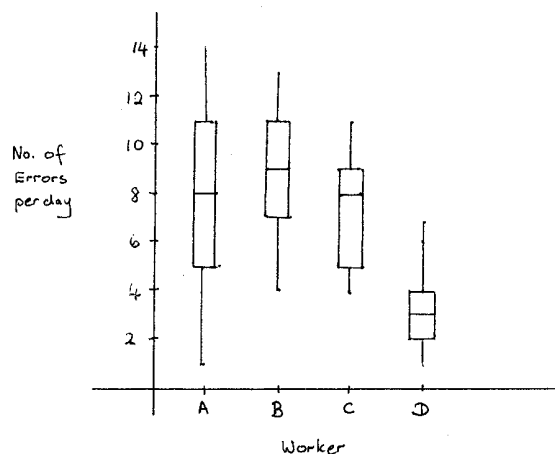


Figure A2.2 Error Rate Question

4. A fair die was tossed with the resultant sequence of numbers: 3 4 4 3 5 3 5. What do you think of these results?

5. Private prisons will help stop suicide.

New Zealand Herald, Monday April 24, 1995

A perennial problem facing prison administrators is inmate suicide. Levels fluctuate greatly without apparent cause but a hopeful tendency over the past few years has been that rates have generally fallen.

After rocketing in the early 1980s to an all-time high of eight (288 per 100,000) in 1985, prison suicides showed a downward trend.

Between 1985 and 1989 there was an average of 5.8 suicides a year; between 1990 and 1993 it was only 4.25. In 1993 there was just one.

These reductions occurred at a time when the prison population grew by 68 per cent, from about 2800 in 1985 to 4700 in 1993.

But suddenly and perplexingly, prison suicides seem to have taken off again. There were 10 suicides in 1994 and, with another two so far this year; the trend threatens to continue.

Justice officials cannot say why.

Figure A2.3 Prison Newspaper Question

- (a) Read this article (Fig. A2.3) and tell me in your own words what you have read and how you react to the information.

(Use as a trial question: A person reading this article said he could explain why. He had recently visited a prison and could see why someone would be driven to suicide as he had found the conditions prisoners had to live under very depressing. Offer a critique of this explanation.)

- (b) Later prompt: the justice official could not explain why, can you?
- (c) Further into the article the author Dr Greg Newbold mused that "it could be that the recent surge in suicides is a random blip". What did he mean by this statement?
- (d) The author also stated that "Maoris were 1.5 times more likely to commit suicide than non-Maoris". What comments would you have after reading that statement? What additional information would you like to see in evaluating this statement and why?

6. On TV1 the weather forecast for rain in different areas is always expressed as percentages.
- If the forecast for Auckland tomorrow is a 70% chance of rain, what does the number tell you?
 - How do you think this number is calculated?
 - Suppose, in fact, it did not rain. What would you conclude about the statement that there was a 70% chance of rain?
 - Suppose you wanted to test how good TV1's predictions for Auckland were. You recorded what happened on 10 days for which a 70% chance of rain had been predicted.
 - On 3 of those 10 days there was no rain. What would you conclude about the accuracy of TV1's forecasts?
 - If TV1's forecasts had been perfectly accurate, what would have happened?
 - What should have been predicted on the days it didn't rain?
 - With what percentage chance?

(Adapted from Konold, 1989)

7. Suppose that a basketball player over a long season has scored 70% of her free throws. Three-quarters of the way through a tournament game she attempts five free throws and scores on only two. The team manager attributed her performance to normal variation, that she scored 70% in the long run and that 70% was only an average so that you had to expect some low scores now and again. Critique the manager's comments.
8. Fitness Newspaper Question. *New Zealand Herald*, May 1995.

No limit on fitness

AP Washington
It is never too late to get fit, according to a study comparing the survival of men who started and maintained exercise programmes with those who never exercised. Mr Steven Blair, head of the Cooper Institute for Aerobics Research in Washington, says a 10-year study showed that men who were unfit but who exercised their way to good physical shape had about half the number of deaths of those who stayed unfit. When only heart attack deaths were considered, the exercise benefit was even greater, the research found. The research, published this week in the *Journal of the American Medical Association*, studied 9777 men who each took two measured treadmill tests five years apart between 1970 and 1989. For those judged unfit in both, the death rate in the following five years was 122 per 10,000. For those judged fit at both tests, it was 40 per 10,000. And for those judged unfit at the first test, but fit in the second, the death rate was 68 per 10,000. Men in the test ranged in age from 20 to 82 years. There were benefits from exercise, however, no matter what the age of the men. Fit men aged 60, for instance, had a 50 per cent lower death rate than persistently unfit men of the same age. "It is never too late to take up exercise to improve your risk of preventing heart attack," Mr Blair said. "A sedentary lifestyle is a very important health risk." He said that 20 to 25 per cent of all Americans led totally sedentary lifestyles.

Figure A2.4 Fitness Newspaper Question

Tell me in your own words what the article (Fig. A2.4) is about. When you read data like this what questions are running through your mind about the study?

Note

The following task was given to all students (about 60) as part of a questionnaire in Phase 2 of the second exploratory study (see Section 4.5.2.1). An analysis of this task is referred to in Chapter 9. All the other items in the pre- and post- questionnaires were not used and are therefore not included.

Suppose that a basketball player over a long season has scored on 70% of her free throws. At the end of a tournament game she attempts five free throws and scores on only two. You are the team manager. To what would you attribute this performance?

A2.2 Second Interview Tasks

1. Repeat question from first interview

Prison Suicide Newspaper Question

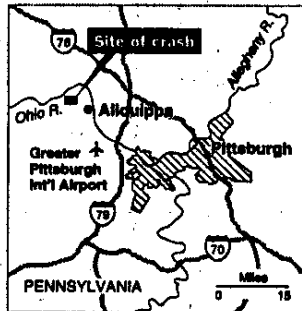
- Read article again and comment, particularly on the fact that the justice department could not explain why. Do you have an explanation as to why the suicide rate increased last year?

2. Air Crash Newspaper Question

- Read the article (Fig. A2.5)
- In your own words say what the article is about.
- What did the professor mean by 'bad luck'?
- What did Shipley mean by 'no thread of continuity'?
- What would you do if you were asked to investigate this airline?

Jetliner Crashes Near Pittsburgh; 130 Passengers Are Feared Dead

— New York Times



A Boeing 737 belonging to USAir crashed yesterday evening five miles from the Pittsburgh airport.

USAir Flight 427, From Chicago, Plows Into a Field as It Lands

By RICHARD PÉREZ-PEÑA

A USAir flight from Chicago with about 130 people aboard crashed just outside Pittsburgh as it was preparing to land yesterday evening, and witness accounts of the disaster scene left little doubt that many of the people aboard were killed.

People at the site of the crash in Raccoon Township, five miles from the airport, said the wreckage of USAir Flight 427, a Boeing 737, was strewn over a large area. Much of the wreckage was unrecognizable as having once constituted an airplane.

"There is not too much left," Sandra Zuback, who lives nearby, told CNN.

Jim Bothwell, the director of Stat-Medivac, an emergency helicopter service, told the network that he flew over the site minutes after the crash, and it appeared there were no survivors.

Dave Shipley, an assistant vice president for USAir, confirmed late last night that the plane had crashed and said there had been no advance warning of any trouble onboard. He declined to comment on how many casualties there might be.

Mr. Shipley told CNN that "there was no indication as to what caused the accident."

After landing at Pittsburgh, the plane was scheduled to go on to West Palm Beach, Fla.

The accident was the fifth fatal USAir crash in the last five years. The last three fatal crashes by regularly scheduled commercial airliners in the United States have all been USAir planes: a 737 that skidded off the runway at La Guardia and into Flushing Bay, killing 37 people; a DC-9-30 that went down outside Charlotte, N.C., which also killed 37 people, and yesterday's accident.

On the airline's record of five crashes in five years, Mr. Shipley said there was "no thread of continuity between the accidents."

"USAir again? That's amazing," said Prof. Arnold I. Barnett, a professor of operations research and statistics at the Massachusetts Institute of Technology who keeps statistics on airline safety records around the world. "USAir, we all know, has had a lot more crashes lately per thousand flights than other major U.S. airlines."

But Mr. Barnett said the number of USAir crashes did not prove that the airline had a bad safety record. A computer analysis this summer, based on the five previous crashes, two of which occurred at La Guardia

Continued on Page A20, Column 3

Jet With 130 Aboard Crashes Near Pittsburgh; High Toll Is Feared

Continued From Page A1

Airport in Queens, found that the airline's performance could plausibly be attributed to bad luck, Mr. Barnett said.

Mr. Barnett said that he did not know if that analysis could apply to yesterday's accident.

He pointed out that USAir Express, the airline's commuter subsidiary for short flights, had a very good safety record. "Its excellence on that is not irrelevant," he said, pointing out that commuter airlines, with their small propeller planes, have long had relatively bad safety records.

The National Transportation Safety Board dispatched a team from Washington to the site of the accident to investigate the cause.

Alan Pollack, a spokesman for the safety agency, said that Tom Haueter was the investigator in charge. In addition, Carl Vogt, a member of the board, also went to Pittsburgh to supervise the inquiry.

The 737, first produced in 1965, is the most popular jetliner in the world, with 2,624 delivered worldwide, according to Boeing. A company spokesman, Randy Harrison, said that 852 of the 300-model 737, which is the model that crashed yesterday, have been delivered since it was introduced in 1984. USAir was the first customer for the 300 model and has ordered 115 of the planes. It had taken delivery of 99 of them as of June 30,

AT A GLANCE

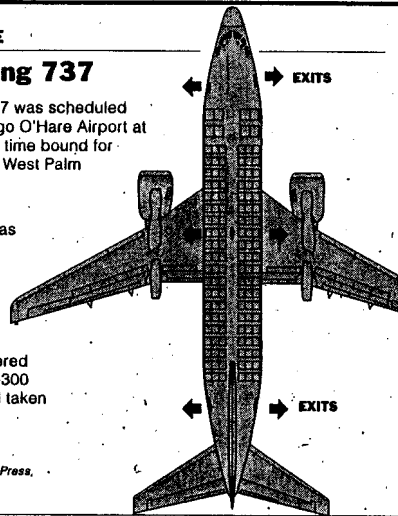
The Boeing 737

USAir Flight 427 was scheduled to leave Chicago O'Hare Airport at 4:50 P.M. local time bound for Pittsburgh and West Palm Beach, Fla.

The 737-300 was introduced in 1984. Those in the USAir fleet carry 128 passengers.

As of June 30, USAir had ordered 115 of the 737-300 model and had taken delivery of 99.

Source: Associated Press, Boeing Aircraft



Mr. Harrison said last night. The second-best selling plane is the Boeing 727, with 1,831 delivered, he said. Mr. Harrison also said that company safety investigators had been alerted.

Witnesses at the scene of yesterday's crash said the jet appeared to lose power and nosedived into the ground a few minutes after 7 P.M., leaving a war zone of flames, twisted

metal and bodies and luggage jeeted in all directions. The site is in Beaver County, about 25 miles northwest of Pittsburgh.

A clerk at the USAir counter at O'Hare airport in Chicago, where Flight 427 originated, said that about 130 passengers and crew members were aboard, though she could not provide a precise figure.

National Transportation Safety Board inspectors have said that wind shear and heavy rain might have contributed to the July 2 crash in North Carolina, though their investigation is not complete.

Safety board investigators said the 1992 crash at La Guardia was likely caused by ice on the plane's wings, and that the plane should have been de-iced closer to take-off.

On Feb. 1, 1991, a USAir 737 landing at Los Angeles International Airport struck a much smaller Sky West Airlines commuter plane that was on the runway. That accident was blamed on air traffic controllers, who put the two craft in the same place at the same time.

On Sept. 20, 1989, another USAir 737 skidded into the East River in an aborted takeoff from La Guardia, killing two people. The safety board blamed that accident on pilot error.

Company News:
Tuesday through Saturday,
Business Day

Figure A2.5 Air Crash Newspaper Question

3. Genetic Damage Question

Human monitoring for exposure to and damage from genotoxic agents is commanding increasing attention. The interplay of environment and genetics on human health means that scientists need to develop methods of measuring damage to human genetic structures. A method that has been suggested is the counting of the number of SCEs observed per cell. An SCE results from a reciprocal exchange of DNA between two sister chromatids (the two spiral filaments that constitute a chromosome). Some scientists believe that an SCE is a possible measure of genetic damage in an individual's DNA. For a particular individual the average of the SCE measurements is recorded.

The graph below (Fig. A2.6) is a plot of genetic damage. **Initially** the scientist divided the data up into these racial groups. If you were the scientist what would you think and what would you do next?

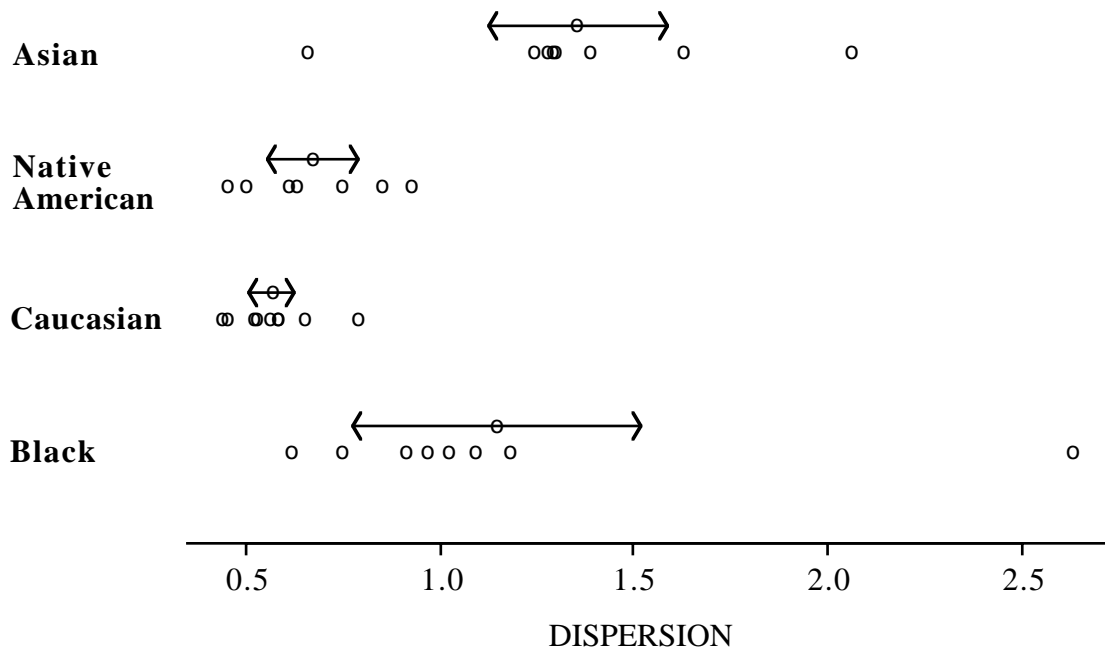


Figure A2.6 Genetic Damage Question

4. Computer Data Question

- Go through the meaning of each variable and ensure they understand the information given.

BIRTH DATA

ID	number of the person	
LOWGT	Low weight (below 2500g)	1=yes 0=no
AGE	Age of mother	
MOMWGT	Normal weight of mother in Kgs	
RACE	white/black/other	
SMOKE	yes/no	
PREM	0 = full-term, 1 = pre-term, 2 = post-term, 3 = very post-term	
HYPERT	hypertension	yes/no
UTIRR	urinary tract infection	yes/no
FTVSTS	month of first visit to antenatal clinic	
BWGT	birth weight of baby in grams	

A sample of the birth data information on the computer is shown here (Table A2.1).

Table A2.1 Birth Data Information

ID	LOWGT	AGE	MOMWGT	RACE	SMOKE	PREM	HYPERT	UTIRR	FTVSTS	BWGT
1	0	20	46.7	white	yes	0	no	no	1	2557
2	0	23	57.8	black	no	0	no	no	1	3062
3	1	34	46.7	white	yes	0	no	no	0	1818
4	1	25	46.7	other	no	1	yes	no	0	1330
5	0	27	57.8	other	no	0	no	no	0	3969
185	1	20	66.7	white	yes	0	no	no	2	1928
186	0	22	42.2	other	no	0	yes	no	0	2750
187	1	29	53.3	other	yes	1	no	yes	0	709
188	0	26	74.7	black	yes	0	no	no	0	2920
189	0	15	60	white	no	0	no	no	0	3941

- What sorts of questions could be answered with this information and why would someone be interested in this information?

[Interviewer note: Technology is now enabling the saving of many premature and low weight babies. It is known that premature and low weight babies do less well as adults being more prone to heart attacks and other illnesses. It is therefore appropriate to investigate the causes of premature and low weight births in order to reduce the number.]

- Imagine you had to do an investigation on low weight and premature births. What would you investigate using this data? [Interviewer note: Suggest there may be a link between smoking and birth weight if time is running out.]
- Do it. [If necessary probe about what they would investigate next?]
- What other aspects could you look at? Investigate any interesting relationships in the data set. [Do if time permits]
- What would you prescribe from this information or look at next?

5. Statistics in Context Questions

There was no time to ask these questions in the interview and therefore they are not included.