Anchor and adjustment heuristic effect on audit judgement

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Continuing research into the effects of various heuristics on the audit judgement process is an important part of the profession's future

Introduction

A basic premiss in human judgemental theory is that people have a limited cognitive ability to deal with an extremely complex environment. In order to cope effectively with that environment, the judgemental process has been reduced to heuristics or simple judgement rules of thumb. These heuristics and their involvement in the human judgement process, especially the area of probabilistic judgement, have been the subject of extensive research efforts in accounting and psychology[1]. The research presented here was designed to provide insight into the effect of one of these rules of thumb, the anchor and adjustment heuristic, on compliance audit test evaluations. Specifically, auditors were tested to determine whether the anchor and adjustment heuristic would be affected by providing the participating auditors with additional audit information concerning compliance test results from the previous year's audit.

The anchoring and adjustment heuristic is a rule-of-thumb which establishes an initial estimate of a population parameter based on some limited initial information (for example, the previous year's work papers) and adjusts that estimate as new information becomes available. However, the adjustment process is not a strict Bayesian statistical revision of the prior probabilities[2]. That is, the process does not take the previously established probabilities (the anchor – prior probabilities) and using the Bayesian formula[3,4], revise them properly into current probabilities (posterior probabilities) given the sample results.

In this experiment, it is assumed that if the anchor and adjustment heuristic is operative then the auditor would use the previous year's error rate as the anchor and use it to estimate the current population error rate. This was investigated in a laboratory experiment. The experiment elicited subjective probabilities concerning compliance test sample results. The experiment consisted of various audit questions and attempted to replicate the normal audit setting by describing a situation which is commonplace in the audit environment.

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Overview and justification for the study

In 1981, the American Institute of Certified Public Accountants adopted a very specific approach to evaluating sample results from compliance tests. The Statement on Auditing Standard 39[5] permitted the auditor to use a judgemental assessment method to evaluate the compliance test sample results. Based on that evaluation, the auditor can estimate the reliance that could be placed on the internal control system. The use of the judgemental method assumes that the method is an adequate approach to the decision concerning the reliability of the client's internal control system. However, the environment today, including the legal and ethical climate, is influencing basic "professional" decisions like this one. The auditor must be looking to the court-established standards with respect to the validity and usability of the audit documentation. The basis of audit decisions then may be subject to outside review and it becomes extremely important to be able to defend these decisions with statistical precision, if at all possible. Adherence to the appropriate standards is then an essential requirement for all portions of the audit.

According to the second standard of fieldwork[6,7], evaluating compliance tests is an essential first step in determining how much reliance the auditor will place on the client's system of internal control. These evaluations are normally accomplished by the auditor-in-charge at the client's place of business, based on audit evidence gathered by subordinates. In most continuing engagements, the auditor-in-charge will have the prior year's work papers available as a reference for the current audit team. This apparent addition of information to a risky decision should improve the auditor's ability to judge compliance as to its adequacy. We make judgements concerning the internal control process from

a sample of "key" (a choice, that is the selection from among alternative) control applications. The structure of the general decision task, whether or not to rely on the client's system of internal control, is very important.

With such an emphasis, the general task needs to be specified in its natural environment[8]. This research adds to that natural environment by providing prior information which will serve as an additional data point for the anchor. The research measures the relative weight which that prior information can bring to the decision process by improving the task structure[9].

An additional independent variable included in this research was the state of the prior audit information. That is, whether the acceptability of the prior year's sample evaluation would affect the subjective probability generated by the evaluation of compliance test sample results. A similar question was evaluated in other research efforts which resulted in determinations that directional changes in internal control strength do affect current audit planning effort for substantive testing[9].

Does the similarity of those error rates affect auditor judgement?

An associated question arises when the sample error rates approximate the previous year's error rate. Does the similarity of those error rates affect auditor judgement? To delve into this question, auditors' responses were measured over two different sample error rates, one close to the current year's results and one quite distant (more than 10 per cent different). Based on previous psychological and accounting research, the participants should not be able to sever the evaluation of one from the other, thus creating a further impediment on the auditor's ability to assess probability through the use of risk assessment method.

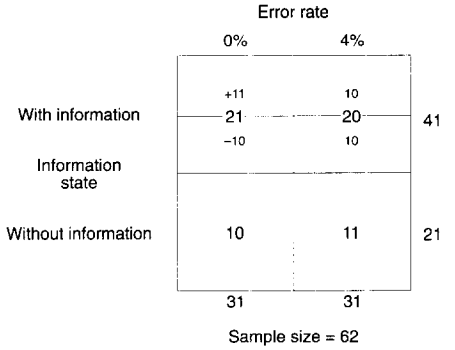
Prior to the publication of Statement on Auditing Standards (SAS) 39[5] auditors chose between risk assessment and fractile assessment as judgemental methods for evaluating sample results. SAS 39 recommended that only the risk assessment method be used. In risk assessment, the subject would be asked to assess the probability that true parameter values exceed the tolerable error rate (the amount of error that the auditor can accept in the client's financial records without either correcting the error(s) or modifying the audit report)[10]. In the risk assessment method, the auditor judges the likelihood that sampling error can explain the difference between the sample error rate and the maximum allowable rate; in other words, what is the probability that the sample error rate is truly representative of the population error rate[11].

Ashton's comments[12] make a cogent point that most experimental judgement tasks involve all the necessary information and that the information is perfectly reliable. However, the experiment described later provides information to decision makers as in real situations, who must decide whether or not it can be relied on. If the anchoring and adjustment heuristic is used, then the auditors makes an internal revision of the prior estimates of the probabilities using a modified adjustment technique. This adjustment process has been shown to adjust inadequately for the sample information provided[2]. Previous accounting research indicates that this heuristic results in adjustments which significantly influence auditors' judgements concerning the amount of subsequent audit tests required[12]. The direction of the change was not that predicted by the conventional anchoring and adjustment heuristic. It was, however, in line with the conservative approach that one associates with auditing; that is, when internal control improved, the experimental participants exhibited a consistent conservative stance and did not reduce the subsequent substantive audit tests, looking towards those tests as a confirmation of the improved internal control system.

An additional research effort was accomplished, which expanded the view of the anchor and adjustment heuristic and its effect on judgement[13]. This study relied on an inertia effect (holding to an initial decision even in the presence of adverse evidence) acting with the anchor and adjustment heuristic to explain the probability estimates elicited in terms of either a recency (over-adjusting judgements by taking into account sequential information) effect, or a primary (biasing the judgement towards the anchor even if the anchor is of little or no value) effect. The study found that auditors employ the anchor and adjustment heuristic and that anchor affected the probability estimate elicited. The research reported here extends this line of research by introducing an external anchor, the previous year's working papers, a common audit situation which may affect the anchor and adjustment heuristic as employed by auditors. The reported study examined three research questions. The research questions were whether:

- information from prior audits will have an effect on the current audit evaluation of sample data;
- information from prior audits which indicates that the previous auditor-in-charge accepted the previous audit sample results will affect current audit evaluation of sample data; and
- previous sample error rates different from the current error rates will have an effect on the current audit evaluation of sample data.

Figure 1. *Experimental design*



Methodology

The testing of the research questions was accomplished by performing a laboratory experiment in which the participants were given an audit judgement exercise to elicit subjective probabilities from a risk assessment point of view (see Appendix). Through the measurement of the subjective probabilities (the dependent variable) over the various information states of the prior audit effort and current sample error rates (the independent variables), the difference among the states could be measured (see Figure 1).

To ensure that the confounding effects of the participants' individual differences were properly accounted for, the experimental design included random assignment of the experimental material to the participants. Each participant was presented with the case material which included both the main experimental question and two other audit probability questions used to mask the main question. The order of presentation of the questions to the participants was varied through a random ordering of the material in the individual audit judgement exercise packets. The participants were asked to evaluate three different tasks. In the main experiment, participants estimated population error rate, given an information state, different prior year's results, and relative similar error rates between years. In the other questions, the participants evaluated accounts receivable and set sample sizes for an audit test. The packets were also arranged in random order.

Participants

Sixty-two professional auditors served as participants in the audit judgement experiment. These participants were either members of a public accounting firm or a government agency (see Table I). The public accounting participants were drawn from five local offices of four different public accounting firms in the same geographical area. One of the firms was regional, the three others represented large national firms. Two of the offices represented one of the large national firms.

Table I. *Participant demographic information*

	Government	Public accounting
Number of auditor participants	18	44
Number of years with employer	6	4
Number of years auditing	> 6	> 4
Number of years since graduations	> 6	4

The public accounting participants were drawn from audit staff members who were attending continuing education programmes at their offices. These individuals were chosen on the basis of availability and were not randomly selected. Geographically, all the participants were working in the same region of the Midwestern USA.

The government auditors were stationed in the Midwest but had audit responsibility worldwide for the Department of the Air Force. Only those individuals who had sufficient experience of auditing (two years or more) took part in this experiment.

The experiment was presented to all participants as an audit judgement exercise which involved the evaluation of sample data resulting from a compliance test. This is the type of work normally associated with senior or semi-senior auditors, and represents one of the first tasks to be accomplished during the course of an audit.

Members of the public accounting firms viewed a videotape of the experimenter which introduced the exercise to the participant. The participants from the government agency were selected by their supervisors and were asked to complete the audit judgement exercise. Questions concerning the exercise were not permitted under either situation.

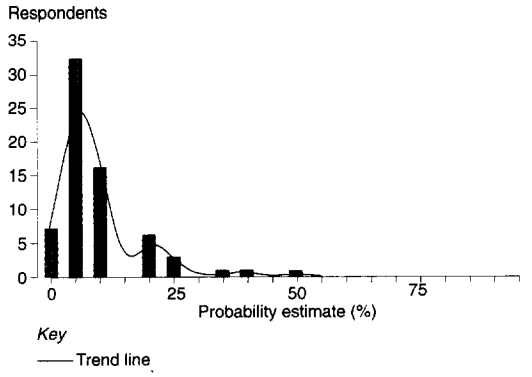
Results

Research question 1

The first research question asks whether there would be an impact on the current audit effort if auditors had information from a prior audit concerning the same compliance evaluation. The following null hypothesis was formulated to permit statistical testing of this hypothesis:

H_01: There will be no difference between the means of the subjective probability estimates derived from two groups of experimental participants, one group having information from a prior audit concerning a similar evaluation and the other group having no prior information.

Figure 2. *Responses*



This statement of the null hypothesis was tested by partitioning the participants into two groups and comparing the estimates of probability elicited using the risk assessment methodology. The chi-square goodness of fit test was performed to determine whether the sample data relating to probability assessments were from a normally distributed population (H_0: this random sample represents observations on a normally distributed random variable with the mean and variance developed below). This was done to choose between parametric and non-parametric statistics for the analysis of the experimental data. An inspection of the raw data in histogram format depicted what may be a log linear relationship of the data (see Figure 2).

A review of research statistics[13] indicated that the Friedman ranks test was the most appropriate. The data included in this experiment are related, that is, there exists a relationship among the cells which goes beyond that of matched pairs or just two related samples. Since this data included several related samples, it is inappropriate to attempt to use the matched pairs ranks test to analyse the data. Instead, a test is required which does not depend on "the assumption of symmetry needed for the matched pairs Wilcoxon signed ranks test..."[14]. The results of the appropriate non-parametric Friedman F_r analysis of variance are presented in Table II.

Table II. *Friedman F_r results*

Source	df	Sum of squares	Mean square	F_r value	Prob > F_r
Model	2	2406.036	1203.018	13.80	0.0001
Information state	1	1469.246	1469.246	16.85	0.0001
Error rate	1	1017.327	1017.327	11.67	0.0012
Error	59	5143.673	87.181		
Corrected total	61	7549.709			

Dependent variable: rankpass = rank for probability assessment

As shown, the probability of exceeding the test statistic is extremely small, indicating that the null hypothesis would be rejected at the 0.05 level of significance. The addition of information, specifically of prior year sample evaluation information, affected the participants' estimates of current year probabilities. Since this procedure (Friedman's F_r) is based on an ANOVA on the ranks within blocks (in this instance the with and without information blocks) rather than the raw data, use of the interaction term was not considered appropriate[14]. Additional analysis was performed using different assumptions. The results of those analyses are shown in Table III and tend to lend additional support to the results presented here. Because the data were not normally distributed, the analysis was changed from parametric to non-parametric methods; in particular, the Friedman F_r statistic. Even though this research contains the results of the appropriate statistical analysis procedure, it is of considerable interest to review the parametric ANOVA results in Table II.

The results shown in Table III make it apparent that provision of information has had an impact on the probability assessments of the participants. The probability of 0.0601 would be tangible evidence even though it exceeds the normal experimental level of 0.05. It can also be seen from these results that the interaction of the two independent variables is less than significant.

Research question 2

The second research question was converted to the following null form:

H_02: There would be no difference in the probability estimates between those participants that received favourable information and those that had unfavourable information.

Table III. *ANOVA results*

Source	df	Sum of squares	Mean square	F value	Prob > F
Model	3	1229.847	409.949	5.07	0.0035
Information state	1	297.145	297.145	3.68	0.0601
Error rate	1	545.073	545.073	6.74	0.0119
Interaction (IS*ER)	1	135.376	135.376	1.68	0.2007
Error	58	4687.137	80.813		
Corrected total	61	5916.984			

Table IV. *T-test (one-tailed) results*

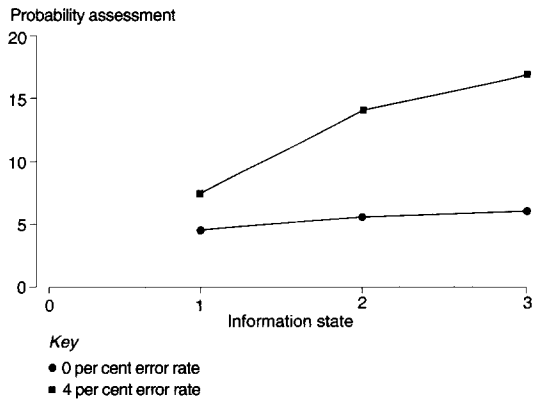
Information category	*N*	Mean	Standard deviation	Standard error	*T*	Degree of freedom	Prob > *T*
Favourable	21	9.33	9.74	2.13	−0.685	39	0.492
Unfavourable	20	11.70	12.29	2.75			

Dependent variable: probability assessment

The belief is that unfavourable information (where the previous auditor-in-charge did not find the previous year's sample results indicative of compliance) from a previous year will cause the current auditor-in-charge to become more conservative as demonstrated through a higher estimate of the probability of significant error in the current audit. Using the *t*-test for comparison of the means of the two groups' probability estimate, the results are presented in Table IV.

The results of this comparison demonstrate that the null hypothesis cannot be rejected and it appears that the directional content of information in the audit environment is not significant. Other statistical procedures were used under different assumptions and the results of those tests are shown here. In the experimental environment which was developed for this experiment, the effect of interaction of the dependent variables was believed to be significant in terms of the combined effect of the variables on the participants' estimates of the population tolerable error rate. However, in all analysis performed on the data, the lack of a significant interaction was apparent and is graphically demonstrated in Figure 3.

Figure 3. *Sample means*



In fact, the probability of exceeding the calculated *F* value approached 0.5 if one considers there to be three information states (no information, favourable information, and unfavourable information) rather than just two (with information and no information). For our purposes, this lack of interaction led to the use of *t*-test as a conservative approach to the comparison of two sample means.

Research question 3

This particular research question can be readily assessed by reference to Table I. Using the statement of the null hypothesis:

$H_0 3$: Different error rates will not affect participants' probability estimates under the risk assessment methodology.

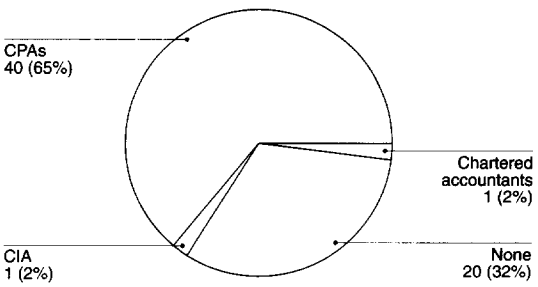
The probability that the calculated F_r value would be exceeded is extremely remote, that is, no greater than 0.0012. It can then be asserted with some confidence that the error rates do have a significant impact on the participants' ability to use the risk assessment method to estimate the probability that population error rate does not exceed 8 per cent.

Additional analysis

Professional certification

The individual participants provided additional data concerning their backgrounds and prior experience in the

Figure 4. *Professional certification*



auditing arena. As shown in Figure 4, approximately 70 per cent of the experimental participants have achieved professional certification as Certified Public Accountants (CPA), Chartered Accountants, or Certified Internal Auditors (CIA).

These particular designations require that their holders be fully aware of the basic rules of their chosen profession. A comparison of those holding the professional certificate with those who do not indicates that there is a statistically significant effect somewhat in excess of the stated level of 0.05 associated with the inclusion of the professional certificate variable. Table V presents the results of the non-parametric test accomplished for this variable.

This information indicates that the impact of the professional certificate adds a little more explanatory power than the original experimental variable, information state. Even in this analysis, the information state maintains its priority as the variable with the most explanatory power.

Continuing professional education

This variable was included in the analysis as part of the stepwise regression performed on the dependent variable. The dependent variable, probability assessment, was ranked and subsequently analysed in the stepwise regression procedure. The level set for entry of a variable was 0.20, the same level set for keeping the variable in the regression equation. The resulting regression is presented in Table VI. No other variable met the 0.20 significance level for entry.

Conclusions and implications for practice

In general, the results indicate that the process that most auditors employ during the course of continuing audit engagements will result in both effective and efficient auditing. This means that increased audit effort can be required when the risk assessment methodology is used which is consistent with the conservative approach that auditors should exhibit. In the context of the current research effort, the practice established in the standards of fieldwork for review of the previous year's work does not enhance the auditors' abilities to accomplish the attestation function with minimum resource expenditure.

Table V. *Friedman F_r results (expanded model)*

Source	df	Sum of squares	Mean square	F_r value	Prob > F_r
Model	3	2723.210	907.737	10.91	0.0001
Information state	1	1375.647	1375.647	16.63	0.0001
Error rate	1	975.130	975.130	11.72	0.0011
Professional certificate	1	317.174	317.174	3.81	0.0557
Error	58	4826.500	83.216		
Corrected total	61	7549.710			

Dependent variable: rankpass = rank for probability assessment

Table VI. *Regression table*

Source	df	Sum of squares	Mean square	F value	Prob > F
Regression	3	5660.916	1886.972	8.30	0.0001
Error	58	13188.084	227.381		
Total	61	18849.000			
	B value	Standard error	Type II SS	F value	Prob > F
Intercept	17.244				
Info state	7.714	4.086	810.447	3.56	0.0640
Error rate	12.342	3.386	2353.586	10.35	0.0021
CPE	–14.114	4.752	2006.111	8.82	0.0043

R square = 0.30032978
C(P) = –1.62060546

Review of prior workpapers

The result of testing the first research hypothesis (that information state will influence probabilities), and the movement to a more conservative opinion of population error when additional information is available to the auditor-in-charge, should lead to more extensive substantive audit testing when prior workpapers are available for review. Rather than reducing uncertainty, the addition of information apparently caused the experimental participants to exhibit higher degrees of uncertainty and simultaneously increases resource expenditures in both the development and execution of more extensive audit testing. This scepticism of the auditor-in-charge provides for viewing the probability of each piece of information in isolation. Considering that compliance testing is specific to the year and the management control system procedures currently in effect, then the previous year's sample results should not be taken to be additional to the current year's work. This addition of information was shown actually to reduce the confidence that the participant was willing to place in the system by increasing the probability that the population error rate will exceed the stated tolerable error rate. This phenomenon will be limited to the area of compliance testing and review, since this situation does not lend itself to easy quantification. However, this particular result

should give rise to a more concerted effort to emphasize statistical evaluation of all appropriately gathered samples. Use of this evaluation process, if the current results are generalizable, would properly quantify risk while keeping audit fees down.

Impact of prior audit evaluations

The second research hypothesis (there is a significant difference between favourable and unfavourable prior information) when tested was found to be not statistically significant. This finding of a weak relationship between the previous year's sample data evaluation and the current year's evaluation of compliance testing, supports the wisdom of the standards of fieldwork, particularly the first[15] and third[16], promulgated by the AICPA. Auditors-in-charge need to know what has occurred with regard to the client in the past. However, those evaluations are just that – past history – and need to be revalidated through the current audit testing process. In this respect, the auditor-in-charge reviews the prior workpapers to determine whether the internal control system has changed and whether the changes are an improvement over past procedures. When this system determination has been completed, the next logical step is to test compliance with the current prescribed system. With appropriate sampling techniques and evaluation, the auditor-in-charge can establish a confidence level based on the sample results relative to the total population tolerable error rate. This critical determination structures the remaining audit effort in terms of substantive testing of transactions, and limits on audit testings are designed to consider the cost-benefit relationships involving audit fees and the resultant risk to third parties resulting from erroneous data.

Current sample error rate

The formulation of the basic research hypothesis led to developing an experimental design which included a high and low level of sample error. It was assumed that the relative importance of error rates (high and low) would have a greater effect on the elicitation of subjective probabilities than the primary independent variable (information state). However, in the analysis of the experiment, it was noted that information state had more effect than the error rate, which indicates that a modification of the anchor used by the auditor-in-charge had occurred. The direction of the shift to a more conservative position was related, not to the type of information (that is, whether the current sample error rate is close to or distant from the prior year's sample error rate), but to the fact that information was available. The current year's sample error rate did have significance (probability $> F_r = 0.0012$) and, as hypothesized, influenced the auditor-in-charge to a greater degree since the higher level was close to exceeding the population tolerable error rate. As the sample error rate comes closer to exceeding the population tolerable error rate, the risk assessment by the auditor-in-charge will tend to require more rather than less substantive audit testing. In this case, it would be in the best interest of the audit firm to increase the scope rather than restrict it.

Heuristic modification

An outcome such as that reported here reinforces the profession's insistence on adherence to standards, especially the standards of fieldwork. This confirmation of appropriateness should be viewed as an indication of the effect of the anchor and adjustment heuristic modified by the conservative approach usually associated with the accounting profession. Although the heuristic changes the subjective probabilities elicited, and there is no apparent difficulty arising from the use of the heuristic, the profession would be prudent to consider a change from any subjective assessment process to those that are statistically objective.

Limitation to external validity

The extension of the conclusions drawn from any laboratory experiment beyond the bounds of the particular experiment is, at best, a risky endeavour. However, in the professional world, one must take risks to develop better markets and potential customers. The profession of auditing needs to continue to develop and mature as part of the business environment. To this end it needs the expanding capabilities of empirical research to show it the way. In doing so, the limits of science must be iterated in order that no reader mistakes the capability of any research effort including the present one. The laboratory has one inherent defect; it is not reality. No matter how realistic the attempt is to make the experiment replicate real life, it cannot. In this research effort there was no interaction between the junior auditor requesting the determination and the pseudo auditor-in-charge. This particular aspect should be a concern in any experimental situation, since auditors function in the audit environment as a team, not just as individuals.

The participants were involved in a classroom situation

An additional aspect of this experiment which may limit its generalizability is the absence of any perceived penalty or reward associated with completing the experimental instrument. Although the experiment was conducted, for the most part, at the place of the auditors' employment, the participants were involved in a

classroom situation. This type of environment may elicit what may be termed "textbook" answers rather than the auditors' true estimates of the population tolerable error rates.

Direction for future research efforts

This continuing line of research into the effects of various heuristics on the audit judgement process is an important part of the profession's future. At the time when the development of artificial intelligence is coming to the forefront in several areas, the need to understand and depict the decision-making process becomes very significant. It will be from these examinations of the decision processes that knowledge engineers will be able to construct the appropriate models for the artificial intelligence environment. The development of future decision support systems for audit management will parallel effort already under way in the systems management area. The current work needs to be extended to include additional significant variables in the audit judgement model. The potential is to lay the ground work for audit specific decision aids beyond those originally envisaged merely as rules for decision makers. Translation of this work into computer models for future research and development is required. Better definition and operationalization of the variables is another important aspect of this line of research that requires more intense research work.

Notes and references

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2. Tversky, A. and Kahneman, D., "Judgement under uncertainty: heuristics and biases", *Science*, Vol. 185, 1974, pp. 1124-31.
3. Bayes Rule can be expressed as:

$$\frac{P(H_1 \mid D)}{P(H_2 \mid D)} = \frac{P(D \mid H_1)P(H_1)}{P(D \mid H_2)P(H_2)}$$

   where H_1 and H_2 are the alternative hypotheses and D is the datum[4].
4. Libby, R., *Accounting and Human Information Processing: Theory and Applications*, Prentice-Hall, Englewood Cliffs, NJ, 1981.
5. American Institute of Certified Public Accountants (AICPA), "Statement on Auditing Standards, Number 39, Audit Sampling", AICPA Audit Standards Division, June 1981.
6. The second standard of fieldwork states: "There is to be a proper study and evaluation of the existing internal control as a basis for reliance thereon and for the determination of the resultant extent of the tests to which auditing procedures are to be restricted"[7].
7. AICPA, *Codification of Statements on Auditing Standards, Numbers 1 to 44*, American Institute of Certified Public Accountants, 1983.
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14. Conover, W.J., *Practical Nonparametric Statistics*, John Wiley & Sons, New York, NY, 1971.
15. "The work is to be adequately planned and assistants, if any, are to be properly supervised"[7].
16. "Sufficient competent evidential matter is to be obtained through inspection, observation, inquiries, and confirmations to afford a reasonable basis for an opinion regarding the financial statements under examination"[7].

Appendix: Audit judgement exercise

You have been selected to participate in an experiment designed to assist both you, as practitioners, and researchers to understand precisely what affects the audit judgement process. In this exercise you have been asked to assist another auditor-in-charge during the course of an ongoing audit engagement. The assistance that you will render will require you to make several decisions based on available information contained in the descriptive scenario. You are to use only the information given; please do not attempt to broaden the question by making assumptions about the engagement.

In addition to the experimental material, you are asked to complete the survey which follows the audit exercise. Please wait until you have completed the exercise, to fill out the survey:

(1) The first year auditor has just completed a review of the client's (a small manufacturer) accounts payable vouchers. The purpose of this review was to determine if vouchers were initialled by the preparing accounts payable clerk. The absence of the clerk's initials is to be considered an error. There have been approximately 4,000 vouchers prepared during the period:

- (With prior information)
  [In reviewing prior year's workpapers you have noted that under similar conditions a sample error rate of 4.2

per cent for a sample of 80 {was/was not} * acceptable to the auditor-in-charge.]*

- (No prior information)*
  You have concluded that a population error rate as high as 8 per cent would not require extending audit procedures. However, if the population error rate is greater than 8 per cent you want to extend the audit tests. Based on the sample results below, estimate the likelihood (between 100 per cent and 0 per cent) that the true population error rate is greater than 8 per cent:
  - [A sample of 80 vouchers with no errors – a sample error rate of 0 per cent.]*
  - [A sample of 80 vouchers with three errors – a sample error rate of 4 per cent.]*

  Your chance estimate: based on a sample of 80 vouchers with no errors, I believe that there is a _____ (between 100 per cent and 0 per cent) chance that the true population error rate is greater than 8 per cent.

  * The bracketed areas were varied over the participants.

(2) The junior auditor has completed a review of the adequacy of the allowance for uncollectable accounts receivable. In the properly aged schedule, the junior auditor points out a rather large (material) customer who is six months overdue. The customer has returned a positive confirmation verifying the balance as correct. The junior accountant informs you that prior experience with this client shows that approximately 50 per cent of the account balance past six months are recoverable. The junior also indicates that the controller believes that the entire account is collectable and no provision is necessary. Additionally the junior has obtained this description from the client's credit manager.

The customer is a rapidly expanding merchandiser of television, radio, stereo, and other consumer electronics equipment. It began as a single store operation in 1874 and now operates a total of 12 stores in three states. Further expansion is planned in the near future. Earnings growth has been strong since 1974. As the firm expanded, its average payment time on accounts receivable has steadily increased. This is due to an inadequate accounting system rather than to cash difficulties. A new computerized accounting system is at present being installed and is expected to remedy the firm's payment problems.

Your probability estimate: based on the above information, what is your estimate_____ (between 100 per cent and 0 per cent) of the collectability of this account receivable?

(3) The junior auditor has just completed an update of internal control in the accounts receivable area and the corrective items contained in last year's management letter have been fully adopted. The increase in the strength of the internal control has been from somewhat weak to very strong. You consult the firm sampling manual for guidance and find the recommended sample size to be twice what was used in the previous year.

Your sample size decision: based on the above information you would:

- use the sample size from last year;
- use a sample size larger than the previous year's sample; and
- use the firm sampling manual's recommended size.

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