A Study of Uncertainty Expressions in Australian Accounting and Auditing Standards

JIM PSAROS *
CHRIS PATEL **
SRIYANI WARNAKULASURIYA ***

This study is an empirical examination of Australian auditors' interpretation of selected key uncertainty expressions such as virtual certainty, expected, reasonable assurance and possible, contained in Australian accounting and auditing standards. The results showed three major findings. First, auditors demonstrated a reasonably high degree of variability in the interpretation of uncertainty expressions. In view of the proliferation of uncertainty expressions within international and Australian accounting and auditing standards, this lack of consistency in interpretation of uncertainty expressions raises some serious concerns. Second, compared with the less experienced auditors, the more experienced auditors demonstrated greater variability in their interpretations of uncertainty expressions. Third, contrary to expectations, this study did not find any difference in judgements between auditors in big-five and non-big-five firms. In aggregate, the findings of the study have implications for standard setting.

* Jim Psaros is Associate Professor at the Newcastle Business School, University of Newcastle, Callaghan, Australia.

** Chris Patel is Associate Professor at the Department of Accounting and Finance, Macquarie University, Sydney, Australia.

*** Sriyani Warnakulasuriya was formerly a Research Student at the University of Newcastle, Callaghan, Australia.

(1) INTRODUCTION

Largely because of globalisation and the increase in complexity of business transactions, standard setters in a number of countries have suggested that the future direction of accounting and auditing standards should be based on an international basis (eg. The UK, Australia, New Zealand). Certainly the Australian Accounting Standards Board is obligated towards the full implementation of International Accounting Standards in respect of financial years on or after 1 January 2005 (Kemp, 2003). The move towards international accounting standards has many implications, most of which are outside the scope of this paper. However, one implication is that international accounting standards will be driven by a principles-based approach.

A principles-based approach requires an examination of the economic substance of business transactions rather than their legal form and has been used in developing accounting and auditing standards in a number of countries for many years. For example, the Chairman of the International Accounting Standards Board has stated a strong preference for this approach (Tweedie, 1991). A principles-based approach has also been adopted by the International Accounting Standards Committee (IASC, 1998, Framework, para. 35). In Australia, SAC 3, *Qualitative Characteristics of Financial Information* defines reliability and relevance as the primary qualitative characteristics of financial information and further specifies that ...to be relevant and reliable it is necessary that the substance rather than the form of transactions or events be reported (para. 24). Recently in the USA, the Financial Accounting Standards Board has indicated its intent to evaluate "concept-based" standards rather than issuing detailed rules based standards (AAA Financial Accounting Standards Committee, 2003).

Consistent with the principles-based approach, the exercise of professional judgment is an important and integral component of interpreting and applying accounting and auditing standards in Anglo-American countries such as US, UK, Australia, Canada and New Zealand (Radebaugh and Gray, 1993, 79-86). It will continue to be with the introduction of international accounting standards in Australia from 1 January 2005. In the application of principle-based accounting and auditing standards, users of the standards are required to make interpretations of key words and phrases which are subjective (hereafter referred to as uncertainty expressions) and require exercise of judgement. Because of their subjectivity, uncertainty expressions may be interpreted in varying ways by different accountants and auditors.

An implicit assumption underlying the principles-based approach to accounting standards is that the exercise of professional judgment by accountants is consistent and uniform within and across these countries. Cross-cultural researchers have often assumed that culture in relatively homogenous within Anglo-American countries and therefore

research findings are generalisable across these countries. However, it has been recognised for some time that accounting is a socio-technical activity in which the values and judgements of professional accountants and users of financial information are important (Jaggi, 1979; Gray, 1988). This is because culture influences individual and collective values and judgements in different countries (Cohen, Pant and Sharp, 1995; 1996).

Empirical evidence suggests that there are significant differences in judgements among professional accountants within the Anglo-American countries on some fundamental accounting concepts and rules (Belkaoui and Picur, 1991). Likewise, Bagranoff, Houghton and Hronsky (1994) found differences in judgements between American and Australian professional accountants in relation to the classification of an item as either extraordinary or ordinary. They concluded that cross-cultural differences are likely to influence the meaning of accounting concepts and that future research in the area is warranted (p.35).

Surprisingly, given the magnitude and importance of the debate concerning the appropriateness of principles-based or rules-based accounting standards, there has been a paucity of empirical evidence to substantiate the various normative claims of consensus in judgements among accountants ***within a country***. This study contributes to this strand of research by providing empirical evidence with respect to judgements of auditors from Australia. One of the aims of accounting standards is to achieve consistency in the treatment of specific events across a range of circumstances at least within a country (Standish, 1984; Joyce and Libby, 1982; Ashton, 1985, Hronsky and Houghton, 2001)[1]. Similarly, auditing standards are intended to provide guidance to auditors in the performance of their function (See AUS 102 *Foreword to Australian Auditing Standards and Guidance Statements*, para. 7).

In the application of accounting and auditing standards, accountants and auditors are required to interpret uncertainty expressions. Because of the subjectivity of uncertainty expressions, they may be interpreted in varying ways. Ultimately, this may result in a lack of consensus in respect of important accounting disclosures and auditing judgements. Yet, providing consensus in professional judgement is a major objective of training in degree programs, continuing professional education and procedure manuals of public accounting firms (Joyce and Libby, 1982). According to Joyce and Libby (1982) where auditor judgements are questioned in litigation or regulatory proceedings, a successful defence entails establishing a professional consensus.

---

[1] Consistency in judgments across countries is also important because of the recent efforts directed at international harmonisation of accounting and auditing standards (Policy Statement 6, in *Accounting Handbook*, 1999; Radebaugh and Gray, 1993).

If there is a high degree of variability in the interpretation of uncertainty expressions there may be two problems. First, there may be inconsistent application of standards which may lead to significant (and unjustified) differences in financial reporting between similar entities. Second, there may be non-compliance with standards which result in litigation. For example, in US the Pennzoil-Texaco case involved interpretation of various uncertainty expressions in accounting standards (Walawski, 1995). Moreover, this issue is important because there has been a proliferation of uncertainty expressions in accounting and auditing standards in Anglo-American countries. For example, Laswad and Mak (1994) found extensive use of uncertainty expressions in Australia, New Zealand, the US, the UK, Canada, Singapore and in International Accounting Standards.

This study extends previous research into interpretations of uncertainty expressions within an Australian context. Specifically, the following hypotheses are formulated and tested.

1. There are significant inter-auditor variances in the interpretation of uncertainty expressions contained in Australian accounting and auditing standards.
2. More experienced auditors are likely to show greater variability in their interpretations of uncertainty expressions than less experienced auditors.
3. Non-big-five auditors are likely to show greater variability in their interpretations of uncertainty expressions than big-five auditors.

The remainder of the paper proceeds as follows. Section two contains a review of the relevant literature and develops the hypotheses for testing. The research method is discussed in section three. The results are contained in section four. Finally, section five contains discussion and conclusions along with the limitations of the paper.

(2) LITERATURE REVIEW AND HYPOTHESES FORMULATION

The psychological and organisational behaviour literature has discussed the variability in the interpretation of uncertainty expressions since the 1950s (for example, Stone and Johnson, 1959). There is quite a voluminous background of research on uncertainty expressions in the psychological and organisational behaviour literature. The topic of uncertainty expressions has also been researched in accounting contexts. The review of the literature contained in this section concentrates on the accounting literature and focuses on three key themes, namely, variability in interpretation of uncertainty expressions, the impact of experience on judgements, and the impact of firm size on judgements. Each of these is discussed in turn.

2.1 Variability in Interpretations

In recent years, accounting researchers have attempted to measure uncertainty expressions used in accounting standards, however, the majority of the research has been conducted in the narrow focus of one US Accounting Standard, Statement of Financial Accounting Standard 5: *Accounting for Contingencies* (hereafter SFAS 5) (examples include Schultz and Reckers, 1981; Jiambalvo and Wilner, 1985; Harrison and Tomassini, 1989; Davidson, 1991; Reimers, 1992; and Amer, Hackenbrack and Nelson 1994 and 1995).

SFAS 5 requires US accounting standard users to distinguish various degrees of certainty as to the possibility of an entity incurring a loss. According to SFAS 5, the likelihood of a loss may be *remote, reasonably possible, or probable*. Thus, account preparers and auditors are required to interpret and apply these phrases. Following is a brief review of some of the major studies which examined numeric interpretations of the phrases contained in SFAS 5.

Schultz and Reckers (1981) examined auditors' assessments of the phrase *reasonably possible* contained in SFAS 5. Sixty-four audit partners from one of the big-eight accounting firms provided a probability threshold (between 0 and 1) for the phrase *reasonably possible*. According to SFAS 5, footnote disclosure is required if the occurrence of a loss is *reasonably possible*. Schultz and Reckers found that the group mean probability threshold for the phrase *reasonably possible* was 0.42.

Jiambalvo and Wilner (1985) conducted a similar study of 80 senior auditors from one big-eight accounting firm. The study attempted to establish a correspondence between probability ranges and the SFAS 5 phrases, *reasonably possible* and *probable*. Jiambalvo and Wilner (1985) considered that significant differences in probability ranges would imply that the words are interpreted differently by auditors. They found that auditors varied significantly in their interpretations. Their subjects provided a mean probability threshold of 0.23 for *reasonably possible* and 0.68 for the word *probable*.

Harrison and Tomassini (1989) and Davidson (1991) also investigated auditors' judgements in respect of the phrases contained in SFAS 5. Subjects in Harrison and Tomassini (1989) provided a mean probability threshold of 0.16 for *reasonably possible* and 0.68 for *probable*. Davidson's (1991) study provided mean probability threshold of 0.10 for *remote*, 0.61 for *reasonably possible* and 0.73 for *probable*.

Reimers (1992) extended the previously mentioned SFAS 5 studies by examining whether there were differences between auditors' interpretations of the phrases in SFAS 5 and those of managers. In addition, the study focused on the level of agreement in respect of the phrases within the audit group studied. Four groups of subjects participated in the study. One group consisted of 29 auditors from one national accounting firm. The three remaining non-audit groups (engineering managers, marketing managers, and graduate MBA students) contained 125 subjects. All subjects were asked to provide numerical interpretations (probability score from 0 to 100) of thirty common verbal expressions of uncertainty obtained from previous research studies and accounting standards. There were three main findings of the study. First, the numerical interpretations of the verbal expressions of uncertainty were similar between auditors and managers. Second, with respect to the three phrases contained in SFAS 5, the mean percentages for the audit group were as follows; *remote* 9.4%, *reasonably possible* 58.1%, *probable* 77.6%. Third, all subject groups showed a high level of agreement with respect to probability scores and ordering of the verbal expressions.

Amer, Hackenbrack and Nelson (1994) also examined the numerical interpretations of phrases contained in SFAS 5. Forty-nine audit managers from one national accounting firm provided the following numerical interpretations; *remote* 12.3%, *reasonably possible* 58.6%, and *probable* 78.7%. In another study of 133 audit managers, Amer, Hackenbrack and Nelson (1995) provided scores of 21.1% for *remote*, 55.3% for *reasonably possible* and 71.6% for *probable*.

Table 1, Panel A provides a summary of the mean scores provided for the SFAS 5 phrases from the previous studies. While Table 1, Panel A does not capture the full complexities of each of the studies it does indicate that there were different assessments between auditors with respect to the above phrases. Furthermore, Reimers (1992) indicated that there was considerable disagreement about the *ranges* covered by the phrases. However, the variable results of US studies into uncertainty expressions, could possibly be interpreted as indicating that the assessment of uncertainty expressions varies over time or in some other predictable manner. For example, the results of 1985 and 1989 are similar, and the 1991, 1992 and 1994 results are also similar but different from the 1985 and 1989 results. The results indicate that perhaps the interpretations of uncertainty expressions vary over time, or perhaps some event that occurred between 1989 and 1991 changed auditors' judgements.[2]

[2] With respect to this period in particular, the American Accounting Association warned that in our profession we are confronting a crisis which has developed at least in part because of a lack of ethical behavior by some accounting professionals (O'Malley, 1993, p.1). The application of a more stringent criteria in 1992 and 1994 studies may perhaps be a reflection of the more cautious approach adopted by the auditors as a reaction to the criticisms.

Table 1
Summary of prior studies of uncertainty expressions

Panel A: Mean scores of uncertainty expressions contained in SFAS 5

Study	Remote % Score	Reasonably Possible % Score	Probable % Score
Schultz & Reckers (1981)	Not tested	42.0	Not tested
Jiambalvo & Wilner (1985)	Not tested	23.0	68.0
Harrison & Tomassini (1989)	Not tested	16.0	68.0
Davidson (1991)	10.0	61.3	72.8
Reimers (1992)	9.4	58.1	77.6
Amer, Hackenbrack & Nelson (1994)	12.3	59.6	78.7
Amer, Hackenbrack & Nelson (1995)	21.1	55.3	71.6

Panel B: Walawski (1995) Numeric interpretations of uncertainty expressions in Australian Accounting Standards

Uncertainty Expression	Mean	S.D
Assured beyond any reasonable doubt (AASB 1020)	95.62	3.4
Virtually certain (AASB 1020)	87.72	7.7
Expected beyond any reasonable doubt (AASB 1011)	85.12	6.6
Expected (AASB 1022)	67.55	14.9
Probable (AASB 1019)	60.52	13.8
Foreseeable (AASB 1009)	50.80	20.0

In New Zealand, using standard setters as subjects, Laswad and Mak (1997) found that there was a lack of consensus in probabilities assigned to 20 uncertainty expressions in their accounting standards. In another study using the same uncertainty expressions, Laswad and Mak (2000) found that there was a considerable lack of consensus among accountants in their numerical interpretations.

Within an Australian context, Walawski (1995) quantified the meaning of uncertainty expressions contained in various accounting standards. Walawski used 120 auditors from big-six and second-tier chartered accounting firms. The subjects were required to quantify the minimum numerical probability with respect to six uncertainty expressions contained in Australian accounting standards. The results are summarised in Table 1, panel B.

Walawski's key conclusion related to Australian accounting standard AASB 1020 Accounting for Income Tax (Tax Effect Accounting). Walawski believed that the intention of the standard was to have *virtually certain* as a more stringent test than a*ssured beyond reasonable doubt.* However, he found that subjects regarded *assured beyond reasonable doubt* as more stringent (95.62) than *virtually certain* (87.72). He stated that this was contrary to the presumed meaning of the terms referred to in AASB 1020.

Another Australian study, Hronsky and Houghton (2001), provides some evidence about the effectiveness of concepts-based accounting standards. They examined whether changes to the wording of a concept (ie. "extraordinary") resulted in different accounting treatments. Hronsky and Houghton found significant differences in the classification of an item based on a new definition of "extraordinary", and concluded that the auditor-subjects perceived the new definition to have a different meaning from the old definition. The study confirmed that the specific wording of a standard is important and has specific applications for accounting treatments.

Psychological researchers have examined uncertainty expressions more extensively than accounting researchers. Based on an extensive literature review of cognitive psychology, Reimers, Wheeler and Dusenberg (1993) concluded:

> To summarize, prior research indicates that there is a wide variability in the ways linguistic expressions of uncertainty are interpreted. Although within some homogeneous professional groups there is surprising agreement, the general conclusion from most studies is that disagreement is pervasive (p. 64).

Both the accounting and psychological literature suggests that there is some variability in the way uncertainty expressions are interpreted. With respect to the US studies reviewed, there are some differences in the results. However, it is invalid to assume that these findings would translate to Australian accounting or Australian auditing standards. US accounting standards and the overall US accounting environment differ quite substantially from the Australian scene. Certainly US standards have been more prescriptive (possibly because of the more litigious environment) than Australian accounting standards. Further, Belkaoui and Picur (1991) and Bagranoff, Houghton and Hronsky (1994) find differences in judgements among accountants within Anglo-American countries. Bearing this in mind it is significant to note that Laswad and Mak (1997 and 2000) reported a lack of consensus among both standard setters and accountants in New Zealand in their numerical interpretations.

The above discussion suggests the following hypothesis.

> *Hypothesis 1: There are significant inter-auditor variances in the interpretation of uncertainty expressions contained in Australian accounting and auditing standards.*

2.2 Impact of Experience on Judgement

A considerable number of studies have investigated the effect of experience on various aspects of audit judgements (Trotman, 1998). The results of the various studies are not consistent. For example, the following studies suggest that experience influences auditors' judgements: Ashton (1974), Ashton and Kramer (1980), Ashton and Brown (1980), Messier (1983), Krogstad, Ettenson and Shanteau (1984). However, studies such as Hamilton and Wright (1982) and Kennedy (1995) showed that experience did not affect auditors' judgements. Indeed, Hamilton and Wright (1982) suggested that even students with no experience had similar levels of judgement consensus to auditors.

Possibly, the conflicting findings might be due to different judgement tasks, the knowledge necessary to complete the task, and the various measures of experience used (Bonner 1990, and Trotman, 1998). The empirical evidence demonstrates that it is necessary to differentiate between *general* audit experience and *domain-specific* experience (Abdolmohammadi and Wright 1987; Bonner 1990; Choo and Trotman 1991; Koonce 1993; Libby and Tan 1994; and Hermanson 1997). For example, using the schema-based psychological research in their theory development, Choo and Trotman (1991) provided evidence to show that auditors with greater task specific experience differ from the inexperienced auditors, "...in the amounts, type, and clustering of items recalled and in the inferences made" (p.482). Bonner (1990) also showed the importance of task specific knowledge in her experiment on analytical risk assessment and concluded that "...auditors task-specific knowledge aided the performance of experienced auditors in both cue selection and cue weighting" (p.72). Similarly, Anderson and Maletta (1994) and Hermanson (1997) provide evidence to show the importance of task specific experience on auditors' judgements. Moreover, Wright and Wright (1997) suggest the importance of including industry experience as a separate identifiable category within domain-specific experience.

With respect to various measures of experience on auditors' interpretation of uncertainty expressions, we present the following three reasons to suggest that greater experience is likely to lead to greater variability in judgements. First, the schema-based psychological research suggests that variations in relevant experience lead to important differences in schema development and application (Lurigio and Carroll,

1985). Specifically, it is suggested that an individual with relevant experience relies on specialized cognitive heuristics in formulating his/her professional judgements, whereas basic heuristics may be used in situations in which the individual lacks the specific task experience (Klayman and Ha, 1987). This is particularly relevant to auditing because the complexity of tasks and environments requires a considerable amount of experience before a well-developed schema is acquired (Choo and Trotman, 1991). Auditors with both greater general and domain-specific experience are likely to have been exposed to the uncertainty expressions on many more occasions within specific contexts. It is therefore suggested that more experienced auditors possessing specialized cognitive heuristics should reflect greater variability in their judgements compatible with their various task specific experiences.

Second, and consistent with the first reason, our suggestion related to the greater the experience the greater the variability in judgements is based on the trend of auditing firms increasing their specialized staff into industry areas (Emerson, 1993). Greater variability in judgements of experienced auditors may be attributable to their varied industrial experience with different standards in different industries (Wright and Wright, 1997).

Third, it is suggested that the smaller variability in interpretation by less experienced auditors might be due to the fact that they may have recently completed university studies and formal courses offered by the professional accounting bodies. For example, the CA Program offered by the Institute of Chartered Accountants in Australia or the CPA Program offered by CPA Australia. Such common accounting education may lead to greater consensus with respect to accounting and auditing judgements. This argument is consistent with the evidence that similarities in formal education curricula may lead to a maturation process where the differences in judgements may converge (Welton and Davis, 1990). Similarly the meaning of accounting concepts held by students changes over time (Houghton, 1987) and the meanings held by inexperienced members of the accounting profession are not identical to those held by practicising accountants (Houghton and Hronsky, 1993).

On the basis of the above discussion, we propose the following hypothesis:

> *Hypothesis 2: More experienced auditors are likely to show greater variability in their interpretations of uncertainty expressions than less experienced auditors.*

2.3 Impact of Firm Size on Judgement

Australian auditing standards apply to all audits and to all members of CPA Australia and The Institute of Chartered Accountants in Australia engaging in audit activities (AUS 102 *Foreword to Australian Auditing Standards and Guidance Statements*, para. 7). As a significant proportion of Australian auditors are employed in a non-big-five setting, it is important to examine their judgements as well as those of big-five auditors. Should the judgements of big-five and non-big-five auditors differ significantly, this would have implications for the potential effectiveness of accounting and auditing standards.

The vast majority of the audit and accounting judgement literature has been based on the judgements of auditors from big accounting firms (eg. Hronsky and Houghton 2001). While their judgements might be representative of all auditors, there is the possibility that because of the different resources and cultures between big and non-big firms the judgements might also vary. Indeed, evidence shows that there are many similarities in organisational culture in the larger multinational accounting firms (Kinney, 1986; Soeters and Schreuder, 1988; Pratt and Beaulieu, 1992; Ponemon, 1992). This is largely the result of factors associated with size (such as size of the client) and to factors such as self-selection and socialisation. Self-selection is the process by which individuals make themselves available for recruitment in organisations that are compatible with their organisational commitment, satisfaction and aspirations (O'Reilly, Chatman and Caldwell, 1991).

Socialisation refers to the process by which values of organisational members are made compatible with those of the organisation (Ponemon, 1992). Consistent with this, Messier (1983) found that partners from non-big-eight firms had less agreement in their judgements than partners from big-eight firms. Likewise, Chewing, Pany and Wheeler (1989) found differences in judgements between partners from big-eight and non-big eight firms. Additionally, Soeters and Schreuder, (1988) found significant differences in organisational culture between big-eight and other accounting firms in The Netherlands. Cohen, Pant and Sharp (1993, p.1) attribute similarities in organisational culture among big accounting firms to standardisation of activities such as the audit process, hiring and promotion criteria, and the implementation of a firm's code of professional.

Accordingly, based on the available theoretical and empirical evidence, the following hypothesis is formulated:

> *Hypothesis 3: Non-big-five auditors are likely to show greater variability in their interpretations of uncertainty expressions than big-five auditors.*

(3) RESEARCH METHOD

3.1 Subjects

The subject population for this research was auditors registered with the Australian Securities and Investment Commission (hereafter ASIC) and who had a mailing address in New South Wales. A listing based on this criterion was obtained from the ASIC. The listing contained 3,700 registered auditors from which 500 auditors were randomly selected. Auditors were considered to be an appropriate sample group to use in the study as they have to regularly interpret accounting and auditing standards in their attestation function. Further, Section 331 (B) of the Corporations Law requires auditors to report on whether financial statements have been prepared in accordance with applicable accounting standards. In addition, compliance with auditing standards is mandatory for Australian auditors (AUS 102 Foreword to Australian Auditing Standards and Guidance Statements, para. 7). Auditors also use uncertainty expressions in communicating with their clients, legal representatives and internal auditors. Accordingly, auditors appear to be a group which would be affected significantly by any variability in the interpretation of uncertainty expressions.

Table 2
Demographic Details

		Number	Percentage %
Age	Years – mean	47.9	-
Audit experience	Years – mean	20.1	-
Gender	Male	105	96.3
	Female	4	3.7
Level	Partner/Principal	98	89.0
	Manager	6	5.5
	Other	6	5.5
Membership	ICA	70	64.8
	CPA	12	11.1
	ICA & CPA	23	21.3
	Other	6	2.8
Firm size	Big-five	18	16.5
	Non-big-five	91	83.5

Five-hundred survey research instruments were sent via mail. Of the 500 instruments sent, 22 were redirected, as return to sender. Ultimately, 120 responses were obtained, providing an effective response rate of 24 percent. Martens and McEnroe (1992) note that a 25 percent response rate is typical for mail surveys. Response bias was tested by comparing responses of the early and late respondents. The results showed no difference in the scores between the two groups.

Table 2 contains a summary of the demographic characteristics of the respondents. As the table indicates, the subjects were highly experienced with an average of 20.1 years of audit experience. As an indication of their seniority, 98 (89%), were a partner/ principal within their firm. Additionally, a majority of the subjects (93, 86.1%) were members of the Institute of Chartered Accountants in Australia and a vast majority were male (105, 96.3%). Note that not all of the 120 subjects replied to all the questions. For example, eleven of the subjects did not indicate their gender.

3.2 Materials and Research Task

Australian accounting and auditing standards were reviewed and 14 uncertainty expressions in 23 auditing and 25 accounting standards were identified. We selected seven uncertainty expressions from three accounting and one auditing standard. It was felt that selecting seven uncertainty expressions was sufficient to test the hypotheses developed in the paper. In addition, by limiting the study to seven uncertainty expressions, the research instrument could be kept relatively brief and thus facilitate a reasonable response rate. The standards which contain the uncertainty expressions are as follows: AASB 1020 *Accounting for Income Tax (Tax Effect Accounting)*, AASB 1011 *Accounting for Research and Development Costs*, AASB 1022 *Accounting for the Extractive Industries*, and AUS 210 *Irregularities Including Fraud, Other Illegal Acts and Errors*. The seven uncertainty expressions, the standard they are contained in, and the date when they were first included in a professional standard are presented in Table 3. Another reason for selecting these standards is that these uncertainty expressions have been used in accounting and auditing standards for several years and therefore auditors participating in this study were likely to be familiar with them.

Table 3
Uncertainty Expressions Contained in Australian Accounting and Auditing Standards Examined

Uncertainty Expression	Current Standard	Original Standard	Date Introduced
Assured beyond any reasonable doubt	AASB 1020, para 12	AAS 3, para 16	1976, July
Virtually certain	AASB 1020, para 13	AAS 3, para 17	1976, July
Expected beyond any reasonable doubt	AASB 1011, para 31	AAS 13, para	1983, March
Expected	AASB 1022, para 11	AAS 7, para 14a	1979, August
Reasonable expectation	AUS 210, para 10	CS 1, para 7	1977, March
Reasonable assurance	AUS 210, para 15	AUP 16, para 5	1983, June
Possible	AUS 210, para 21	AUP 16, para 11	1993, March

To place the task in a proper context, the name of the standard and the paragraph which contains the uncertainty expression, were included in the research instrument. For each of the seven uncertainty expressions, subjects were asked to provide an equivalent numerical probability between zero (0%) and hundred (100%).[3] It is assumed that the point estimate provided by the subjects is the low cutoff point for the probability threshold. An example of one of the questions in the research instrument is presented in Figure 1.

Figure 1
Example of Survey Question

'Accounting for Income Tax (Tax Effect Accounting)' (AASB 1020. 12)

A future income tax benefit shall only be carried foreword as an asset where realisation of the benefit can be regarded as being **assured beyond any reasonable doubt**.

In the context of **AASB 1020.12,** please provide a numerical interpretation (from 0% to 100%) of the uncertainty expression **assured beyond any reasonable doubt**.

assured beyond any reasonable doubt _____%

[3] The questions were presented in the same order to all subjects. Note that this may cause an order effect in the way subjects respond to the questions.

(4) RESULTS

4.1 Measures of Central Tendency

Table 4 presents the summary data for the numerical interpretations of the seven uncertainty expressions. A Shapiro-Wilk W Test performed on the uncertainty expressions revealed that the data was not normally distributed for any of the seven uncertainty expressions. For this reason, subsequent analysis of the data was non-parametric.

Table 4
Descriptive Statistics of Numerical Interpretations of Uncertainty Expressions

	Mean	Median	Min	Max	Standard Deviation	Coefficient of Variation
Virtually certain	88.04	95	10	100	17.60	19.31
Assured beyond any reasonable doubt	85.40	90	40	100	13.82	16.18
Expected beyond any reasonable doubt	81.06	85	8	100	17.99	22.10
Reasonable assurance	71.37	75	10	100	20.38	28.13
Expected	70.63	75	5	100	18.31	25.92
Reasonable expectation	68.92	75	10	100	20.93	30.30
Possible	56.11	55.73	5	100	28.53	51.20

A series of Kruskal-Wallis Tests of all combinations of the seven uncertainty expressions (i.e. 21 separate tests) revealed 15 instances where the expressions were significantly different at the five percent confidence level. These results show that subjects discriminated between the meaning of the respective uncertainty expressions. A summary of the results of the Kruskal-Wallis Tests is contained in Table 5.

Table 5
Kruskal-Wallis Tests of Significant Levels

	Virtually certain	*Assured beyond any reasonable doubt*	*Expected beyond any reasonable doubt*	*Reasonable assurance*	*Expected*	*Reasonable expectation*
Assured beyond any reasonable doubt	.0001					
Expected beyond any reasonable doubt	.0002	.0001				
Reasonable assurance	.0244	.0188	.0043			
Expected	.1007	.1155	.0109			
Reasonable expectation	.0080	.0077	.0260	.0001	.0271	
Possible	.0975	.1274	.0457	.0282	.4492	.0414

Note that auditors in this study discriminated between the following pairs of uncertainty expressions which may appear to be rather similar: *reasonable expectation* and *reasonable assurance; reasonable expectation* and *expected; possible* and *reasonable assurance;* and, *possible* and *reasonable expectation.* In contrast, auditors did not discriminate between the following pairs: *expected* and *virtually certain; expected* and *assured beyond any reasonable doubt; possible* and *virtually certain;* and, *possible* and *assured beyond any reasonable doubt.*[4]

Hypothesis 1: Variation in Interpretation
The difficulty in testing the hypothesis on inter-auditor variances is determining what level of variation is considered reasonable. Therefore, three separate statistical analyses were conducted, namely, standard deviation, coefficient of variation and Kendall's coefficient of concordance.

While the standard deviation and the coefficient of variation do not provide a specific test of whether the variation is or is not reasonable, they do provide a measurement of the variation of the data. As indicated in Table 4, the standard deviations range from a minimum of 13.82 (*assured beyond reasonable doubt*) to a maximum of 28.53 (*possible*). Similarly, the coefficient of variation ranges from minimum of 16.18 (*assured beyond reasonable doubt*) to a maximum of 51.20 (*possible*). There also

[4] A series of paired T- Tests of all combinations of the seven uncertainty expressions (i.e., 21 separate tests) revealed 19 instances where the expressions were significantly different at the five percent confidence level. It is therefore suggested that these unexpected findings are more a result of the type of the specific non-parametric test employed rather than any systematic or conceptual differences.

appears to a general trend whereby the higher the mean score for the uncertainty expression, the lower the standard deviation and the coefficient of variation.

Kendall's coefficient of concordance (*W*) was used to measure the extent of agreement between subjects' numerical interpretations of the uncertainty expressions.[5] The extent of agreement was based on the ordering of the uncertainty expressions. The measurement can rank between 0 for no agreement and +1 for complete agreement. In the current study (*W*) was calculated at = 0.334. This indicates a relatively low level of agreement in the ordering of the uncertainty expressions between the subjects.[6]

In view of the relatively high standard deviations, high coefficient of variations and low Kendall coefficient of concordance for uncertainty expressions, the variance in interpretation hypothesis is supported. Therefore, it is concluded that there are significant inter-auditor variances in the interpretation of uncertainty expressions contained in Australian accounting and auditing standards. This variance violates an assumption of principles-based accounting standards, ie. that users of standards will make similar interpretations of accounting standards in the absence of detailed and specific rules.

Hypothesis 2: Experience Effect

To test the hypothesis on how experience affects variability in interpretation of uncertainty expressions, consistent with Wright and Wright (1997), the measure of experience in terms of longevity in the field was separated into six categories ranging from 0-3 years, 4-6 years, 7-9 years, 10-19 years, 20-29 years and 30 years and over. Selecting appropriate cutoff points is necessarily subjective. These cutoff points were selected because they represented points where it was felt that auditors were at distinctly different levels of experience. It was felt necessary to have 3 cutoff points in the in the first 10 years experience. This was to acknowledge the fact that there is a steeper learning curve in the first decade of audit experience than in later years. Nevertheless, when the 3 categories (0-3 years, 4-6 years, & 7-9 years) were collapsed into 1 category, the results of testing did not differ significantly.

[5] Kendall's coefficient of concordance (*W*) is a non-parametric test that related samples are from the same population. It has been used in the accounting literature to measure the extent of between subject agreement [(see Kida (1984), Reimers (1992), Goodwin (1995).]

[6] Goodwin (1995) obtained (*W*) values of 0.271 and 0.289 and described them as suggesting a low level of overall agreement. Reimers (1992) obtained (*W*) values of 0.879, 0.836, 0.803 and 0.823 and described them as showing a very high level of agreement.

Table 6 reveals the mean, median, coefficient of variation of the uncertainty expressions for each of the six audit experience categories, and also the results of the Kruskal-Wallis Tests. The tests were conducted to determine if there were significant differences in the numerical interpretations across the experience groups. Not one of the seven Kruskal-Wallis Tests found significantly different rankings between any of the six experience levels.[7] The analysis was then expanded to compare the variations in the numerical interpretations of the uncertainty expressions between the six experience levels. Table 6 also provides the ranking of the coefficient of variation on the basis of experience level for each of the seven expressions.[8]

A Bartlett's test was conducted on the each of the seven phrases to determine whether there were significantly different variances between the subjects on the basis of experience. For three of the seven phrases there was significantly different variances [*virtually certain* ($p = 0.0001$), *expected beyond any reasonable doubt* ($p = 0.0001$), *possible* ($p = 0.0359$)].

The relative rankings of the coefficient of variation for each phrase were then compared on the basis of experience level. Significantly, the least experienced group (0-3 yrs) had the smallest coefficient of variation for five of the seven phrases, and the second smallest for two others. In contrast, the most experienced group (30+ years) had the largest coefficient of variation for four of the phrases, and the second largest for one other. A Kruskal-Wallis test was performed on the ranking of the coefficient of variation. It indicated that the ranking were significantly different ($x^2 = 12.13$, $df = 5$, $p = 0.062$).[9] This suggests that there is significantly less variation in the interpretation of uncertainty expressions for less experienced auditors compared to the very experienced auditors. These results support the hypothesis that experienced auditors are more likely to show greater variability in their interpretations of uncertainty expressions than inexperienced auditors.

[7] Seven one-way ANOVAs were also performed. Not one of the ANOVAs found significantly different mean scores between any of the 6 experience levels.

[8] The rankings are based on the size of the coefficient of variation, within each uncertainty expression, between the 6 experience levels. For example, for the phrase virtually certain, the 7-9 years experience level had the smallest coefficient of variation (6.13) and thus it was ranked 1. The 0-3 years experience level had the second smallest coefficient of variation (7.37) and was ranked 2. The 10-19 years experience level had the third smallest coefficient of variation (12.92) and was ranked 3. The ranking process continued for all six experience levels.

[9] When the 3 categories (0-3 years, 4-6 years, & 7-9 years) were collapsed into 1 category, the Kruskal-Wallis testing was still significant ($x^2 = 10.45$, $df = 3$, $p = 0.0167$).

Table 6
Numerical Interpretations of Uncertainty Expressions by Audit Experience

	Virtually certain	*Assured beyond any reasonable doubt*	*Expected beyond any reasonable doubt*	*Reasonable expectation*	*Reasonable assurance*	*Expected*	*Possible*
0-3 years							
n = 8							
mean	92.55	85.38	89.38	81.88	82.50	72.75	43.00
median	95.00	87.50	90.00	82.50	85.00	70.50	47.00
c of variation	7.37	16.49	9.19	14.94	15.19	22.89	44.25
rank	(2)	(4)	(1)	(1)	(1)	(1)	(4)
4-6 years							
n = 8							
mean	83.75	84.25	83.63	69.38	79.38	75.00	70.00
median	90.00	85.00	87.50	67.50	82.50	77.50	70.00
c of variation	19.86	16.73	18.94	20.90	17.31	23.64	28.57
rank	(5)	(5)	(3)	(2)	(2)	(3)	(2)
7-9 years							
n = 5							
mean	93.00	90.00	69.60	62.00	67.00	67.00	54.00
median	95.00	90.00	80.00	65.00	65.00	70.00	50.00
c of variation	6.13	3.93	50.76	31.54	20.16	27.72	16.56
rank	(1)	(1)	(6)	(4)	(3)	(5)	(1)
10-19 years							
n = 33							
mean	92.12	85.36	84.30	72.61	74.85	74.09	52.33
median	95.00	90.00	85.00	80.00	85.00	75.00	50.00
c of variation	12.92	15.87	13.72	32.71	29.09	23.97	66.41
rank	(3)	(3)	(2)	(5)	(4)	(4)	(6)
20-29 years							
n = 27							
mean	91.70	86.26	80.15	67.22	71.11	64.81	53.52
median	95.00	90.00	85.00	70.00	75.00	70.00	50.00
c of variation	13.80	14.32	19.86	27.55	29.79	33.25	47.03
rank	(4)	(2)	(4)	(3)	(5)	(6)	(5)
30+ years							
n = 26							
mean	80.69	84.81	75.88	66.19	69.81	71.04	62.12
median	90.00	90.00	80.00	72.50	75.00	70.00	60.00
c of variation	31.75	17.61	31.69	35.32	31.09	23.54	42.67
rank	(6)	(6)	(5)	(6)	(6)	(2)	(3)
Kruskal – Wallis p =	.2941	.9990	.6281	.1726	.3460	.4685	.3201
Bartlett p =	.0001	.1768	.0001	.2477	.3533	.8508	.0359

Hypothesis 3: Firm Size Effect

To test the effect of firm size, subjects were divided into two groups on the basis of current employment in either a big-five or non-big-five accounting firm.[10] Table 7 indicates the mean, median, and coefficient of variation of the uncertainty expressions for each firm size category and also the results of the Kruskal Wallis and Bartlett's Tests.

Table 7
Numerical Interpretations of Uncertainty Expressions by Firm Size

	Virtually certain	*Assured beyond any reasonable doubt*	*Expected beyond any reasonable doubt*	*Reasonable expectation*	*Reasonable assurance*	*Expected*	*Possible*
Big 5 Firm n = 17							
mean	91.47	82.76	76.88	65.69	67.81	73.59	50.41
median	95.00	80.00	80.00	72.50	75.00	70.00	30.00
c of variation	8.73	14.45	22.18	40.27	38.73	22.77	62.95
rank	(1)	(1)	(2)	(2)	(2)	(1)	(2)
Non-Big 5 Firm n = 95							
mean	87.98	86.06	81.94	70.12	74.05	70.19	56.74
median	95.00	90.00	85.00	75.00	80.00	75.00	50.00
c of variation	20.18	15.59	21.94	28.49	25.35	26.85	49.61
rank	(2)	(2)	(1)	(1)	(1)	(2)	(1)
Kruskal – Wallis p =	.6952	.2054	.1095	.7421	.5544	.5768	.4602
Bartlett p =	.0006	.5616	.7881	.1312	.0674	.5543	.5238

Kruskal Wallis Tests were conducted to determine if there were significant differences in the numerical interpretations across the firm size categories. Not one of the seven Kruskal Wallis Tests found significantly different rankings between big-five and non-big-five auditors.[11] The analysis was then expanded to compare the variations in the

[10] The experience levels between Big 5 and non-Big 5 firms very similar as follows. For example Big 5 auditors had a mean of 22 years audit experience, non-Big 5 auditors had a mean of 19.8 years. The standard deviation was 7.8 years for Big 5 auditors and 11.9 years for non-Big 5 auditors. The median for both Big 5 and non-Big 5 auditors was 20 years. So in aggregate both groups were very experienced and differed only marginally.

[11] Seven one-way ANOVAs were also performed. Not one of the ANOVAs found significantly different mean scores between big-five and non-big-five auditors.

numerical interpretations of the uncertainty expressions between big-five and non-big-five auditors. Table 7 also provides the rankings of the coefficient of variation for each of the seven expressions and the significance levels of Bartlett's testing.

Bartlett's tests were conducted on the each of the seven phrases to determine whether there were significantly different variances between the subjects on the basis of firm size. For two of the seven phrases there were significantly different variances [*virtually certain* ($p = 0.0006$), and *reasonable assurance* ($p = 0.0674$). However, there was no obvious pattern with big-five subjects demonstrating a smaller variance for one of the phrases (*virtually certain*) than non-big-five subjects, but a larger variance for the other (*reasonable assurance).*

In respect of three of the seven uncertainty expressions, big-five auditors had a smaller coefficient of variation than non-big-five auditors. For the other four uncertainty expressions, big-five auditors had a larger coefficient of variation than non-big-five auditors. Thus, there does not appear to be any systematic difference in the variability of the numeric interpretations between big-five and non-big-five auditors. Therefore the hypothesis was rejected. The size of the accounting firm (big-five or non-big-five) had no impact on the auditor's interpretation of uncertainty expressions.

(5) DISCUSSION AND CONCLUSIONS

5.1 Key Findings and Implications

The key finding of the paper is that auditors demonstrated a reasonably high degree of variability in the interpretation of seven uncertainty expressions in Australian accounting and auditing standards. This lack of consensus in auditors' judgements violates an implicit assumption in the principles-based approach to standard setting that assumes that the exercise of professional judgement by accountants and auditors is uniform within and across countries. This finding has implications for standard setting within Australia and internationally.

In view of the proliferation of uncertainty expressions within Australian accounting and auditing standards the results of our study raise some concerns. If there is significant variability in the interpretation of uncertainty expressions in accounting and auditing standards then possibly such standards are not communicating a common message to accountants and auditors. While this might suggest that accounting standards would be more effective if they did not contain uncertainty expressions, this presupposes that it is possible to draft effective standards without them. Further, it presupposes that the variability in interpretation of uncertainty expressions leads to an unreasonable level of variability in financial statement disclosures and audit

judgements. Neither of these propositions is necessarily valid. An alternative suggestion might be to maintain uncertainty expressions within standards, but to provide additional explanatory material within them. Additional guidance within the standards with respect to interpreting uncertainty expressions would also help accountants and auditors to defend some of the controversial disclosures in financial statements.

In our paper three variables were examined, namely, variance in interpretation, audit experience and firm size employment (i.e., big-five or non-big-five). It was found that there are significant inter-auditor variances in the interpretation of uncertainty expressions contained in Australian accounting and auditing standards. When subjects were examined on the basis of audit experience and firm size there was found to be few significant differences in terms of the mean and median numerical interpretations of the uncertainty expressions. However, when the variance of the judgements was examined significant results were found. Specifically, the results support the hypothesis that more experienced auditors are likely to show greater variability in their interpretations of uncertainty expressions than less experienced auditors.

Interestingly, six of the uncertainty expressions used in the study were contained in previous accounting and auditing standards dating back more than fifteen years. Paradoxically, the more experienced auditors would have been exposed to the uncertainty expressions on many more occasions in domain–specific contexts than the less experienced auditors. However, the results are consistent with the suggestion that greater variation in judgements of experienced auditors may be attributable to varied industrial experience with different standards in different industries. Additionally, the smaller variability in interpretation by the least experienced auditors might be due to the fact that the least experienced auditors were more likely than the most experienced auditors to have recently completed university studies and formal courses offered by the professional accounting bodies.

With respect to firm size and the variability of the responses, there were no significant differences. That is, subjects currently employed by big-five firms did not show less variability in the interpretation of uncertainty expressions than non-big-five subjects. While this suggests that the different infrastructure and culture between big-five and non-big-five does not impact on the subjects judgements, it may be that some of the non-big-five auditors have previously been employed in a big-five setting. In any event it does provide some evidence that the accounting and auditing standards are equally effective (or ineffective) to auditors irrespective of the size of the accounting firm in which they are employed.

5.2 Limitations and Concluding Comments

In considering the results of this study the following limitations are acknowledged. First, the uncertainty expressions were not provided in a specific accounting or auditing context. Auditors may attach different numerical probabilities when the expressions are provided in a specific accounting context.[12] Moreover, the conclusions based on an examination of seven uncertainty expressions may not be generalisable to other uncertainty expressions. Second, subjects were required to perform the experimental task and return their responses via mail. As documented in the literature, the use of experimental tasks administered via mail raises potential control problems (see Trotman, 1996). Third, the auditors included in the sample were all registered and domiciled in New South Wales. In addition 96.3 % of the auditors included in the sample were males.

This study presents evidence that there is some variability in the interpretation of uncertainty expressions in Australian accounting and auditing standards. Following on from this finding an important line of research would be to determine if variability in the interpretation of uncertainty expressions leads to corresponding different accounting and auditing judgements. The study also found that less experienced auditors showed greater consensus in their judgements than more experienced auditors. Future studies could examine whether the finding is robust across other accounting and auditing settings.

REFERENCES

AAA Financial Accounting Standards Committee, (2003). Evaluating concepts-based vs. rules-based approaches to standard setting. *Accounting Horizons*, 17 (1), 73-89.

Abdolmohammadi, M. and A. Wright (1987). An examination of the effects of experience and task complexity on audit judgements. *The Accounting Review*, 62 (1), 1-13.

Accounting Handbook (2003). CPA Australian. Sydney, Prentice Hall.

Amer, T., K. Hackenbrack, and M. Nelson (1994). Between auditor differences in the interpretation of probability phrases. *Auditing: A Journal of Practice and Theory*, 13 (1), 126-136.

[12] It is worth noting however that one of the few studies to consider this issue (Amer, Hackenbrack and Nelson, 1994) stated: "Six of the probability phrases used in this (Amer et.al.) study were also used in Reimers (1992). The numerical interpretations are remarkably similar even though auditors in Reimers (1992) interpreted probability phrases out of context and the auditors in the current study interpreted probability phrases in a particular accounting context. This result provides preliminary evidence that phrases in the accounting context might not be as vulnerable to context effects as suggested by previous research in psychology" (p. 131).

Amer, T., K. Hackenbrack, and M. Nelson (1995). Context-dependence of auditors' interpretations of the SFAS No. 5 probability expressions. *Contemporary Accounting Research*, 12 (1), 25-39.

Anderson, B.H. and M. Maletta (1994). Auditor attendance to negative and positive information: the effect of experience-related differences. *Behavioral Research in Accounting*, 6, 1-20.

Anderson, U. and W.F. Wright (1988). Expertise and the explanation effect. *Organizational Behavior and Human Decision Processes*, 42, 250-269.

Asare, S.K. and L.S. McDaniel (1996). The effects of familiarity with the preparer and task complexity on the effectiveness of the audit review process. *The Accounting Review*, 71 (2), 139-159.

Ashton, R.H (1974). An experimental study of internal control judgments. *Journal of Accounting Research*, 12 (1), 143-157.

Ashton, A.H (1985). Does consensus imply accuracy in accounting studies of decision making. *The Accounting Review*, 65 (1), 173-185.

Ashton, R.H., and P.R. Brown (1980). Descriptive modelling of auditor's internal control judgments: replication and extension. *Journal of Accounting Research*, 18 (1), 269-277.

Ashton, R.H., and S.S. Kramer (1980). Students as surrogates in behavioural accounting research: some evidence. *Journal of Accounting Research*, 18 (1), 1-15.

Auditing Handbook (2003). CPA Australia, Sydney, Prentice Hall.

Bagranoff, N.A, K.A. Houghton and J. Hronsky (1994). The structure of meaning in accounting: a cross-cultural experiment. *Behavioral Research in Accounting*, 6, (Supplement), 36-61.

Bedard, J (1991). Expertise and its relation to audit decision quality. *Contemporary Accounting Research*, 8 (1), 198-222.

Belkaoui, A.R. and R.D. Picur (1991). Cultural determinism and perceptions of accounting concepts. *International Journal of Accounting*, 26 (3), 118-130.

Beyth - Marom, R (1982). How probable is probable? A numerical translation of verbal probability expressions. *Journal of Forecasting*, 1, 257-269.

Bonner, S.E (1990). Experience effects in auditing: the role of task specific knowledge. *The Accounting Review*, 65 (1), 72-92.

Bonner, S.E. and B.L. Lewis (1990). Determinants of auditor expertise. *Journal of Accounting Research*, 28 (Supplement), 1-20.

Bonner, S.E., Libby, R. and M.W. Nelson (1996). Using decision aids to improve auditors' conditional probability judgments. *The Accounting Review*, 71 (2), 221-240.

Brun, W. and K.H. Teigen (1988). Verbal probabilities: ambiguous, context dependent or both. *Organisational Behaviour and Human Decision Process*, 41, 390-405.

Budescu, D.V. and T.S. Wallsten (1985). Consistency in interpretation of probabilistic phrases. *Organisational Behaviour and Human Decision Process*, 36, 391-405.

Chesley, G.R. and H.A. Weir (1985). The challenge of contingencies: adding precision to probability. *CA Magazine*, April, 38-41.

Chesley, G.R (1985). Interpretation of uncertainty expressions. *Contemporary Accounting Research*, 2 (2), 179-199.

Chewing, G., K. Pany and S. Wheeler (1989). Auditor reporting decisions involving accounting principle changes: some evidence on materiality thresholds. *Journal of Accounting Research*, 27 (1) 78-96.

Choo, F. and Trotman, K.T (1991). The relationship between knowledge structure and judgments for experienced and inexperienced auditors. *The Accounting Review*, 66 (3), 464-485.

Cohen, J.R., L.W. Pant and Sharp (1993). Culture based ethical conflicts confronting multinational accounting firms. *Accounting Horizons*, September, 1-13.

Cohen, J.R., L.W. Pant and Sharp (1995). An exploratory examination of international differences in auditors' ethical perceptions. *Behavioral Research in Accounting*, 7, 37-64.

Cohen, J.R., L.W. Pant and Sharp (1996). A methodological note on cross-cultural accounting research. *The International Journal of Accounting*, 31 (1), 55-66.

Davidson, R.A (1991). Practical difficulties encountered in selecting uncertainty words: the example of accounting standards. *Applied Psychology: An International Review*, 40 (4), 353-363.

Emerson, J (1993). KPMG Peat Marwick: setting the new practice frame-work standards. *Professional Services Review*, June.

Fischhoff, B (1982). *Debiasing in judgment under uncertainty: heuristics and biases*, edited by Kahneman, D., Slovic, P. and A. Tversky, New York: Cambridge University Press, 422-444.

Goodwin, J (1995). The audit of revalued assets: an exploratory study. *Accounting Research Journal*, 8 (2), 63-74.

Gray, S.J (1988). Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus*, 24 (4), 1-15.

Hamilton, R.E. and W.F. Wright (1982). Internal control judgements and effects of experience: replication and extensions. *Journal of Accounting Research*, 20 (2), pt 2, 756-765.

Harrison, K.E. and L.A. Tomassini (1989). Judging the probability of a contingent loss; an empirical study. *Contemporary Accounting Research*, 5, 642-648.

Hermanson, H.M. (1997). The effects of audit structure and experience on auditors' decisions to isolate errors. *Behavioral Research in Accounting*, 9 (Supplement), 76-93.

Houghton, K.A. (1987). The development of meaning in accounting: An intertemporal study. *Accounting and Finance,* 27, 25-40.

Houghton, K.A. and Hronsky, J.J.F. (1993). The sharing of meaning between accounting students and members of the accounting profession. *Accounting and Finance,* 33, 85-101.

Hronsky, J.J.F. and K.A. Houghton (2001). The meaning of a defined accounting concept: regulatory changes and the effect on auditor decision making. *Accounting, Organizations and Society*, 26, 123-139.

Jaggi, B.L (1979). The impact of the cultural environment on financial disclosures, in *Notable Contributions to the Periodical International Accounting Literature –1975-78*, CA: American Accounting Association.

Jiambalvo, J. and N. Wilner (1985). Auditor evaluation of contingent claims. *Auditing: A Journal of Practice and Theory*, 5 (1), 1-11.

Joyce, E.J. and R. Libby (1982). Behavioural studies of audit decision making. *Journal of Accounting Literature*, 1, 103-123.

Kemp, S (2003). What's new for June 2003 financial reports. *CA Charter*, 74 (6), 54-56.

Kennedy, J (1995). Debiasing the curse of knowledge in audit judgment. *The Accounting Review*, 70 (2), 249-273.

Kida, T. (1984). The impact of hypothesis testing strategies on auditors' use of judgement data. *Journal of Accounting Research*, 22 (1), 332-340.

Kinney, W (1986). Audit technology and preferences for auditing standards. *Journal of Accounting and Economics*, 8 (2), 73-89.

Klayman, J. and Ha, Y (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, 94, 211-228.

Koonce, L (1993). A cognitive characterization of audit analytical review. *Auditing: A Journal of Practice and Theory*, 2 (Supplement), 57-76.

Krogstad, J.L., R.T. Ettenson, and J. Shanteau (1984). Context and experience in auditors' materiality judgements. *Auditing: A Journal of Practice and Theory*, 4 (1), 54-73.

Laswad, F., and Y.T. Mak (1994). An international comparison of uncertainty expressions in accounting standards. *The International Journal of Accounting*, (29), 1-19.

Laswad, F., and Y.T. Mak (1997). Interpretations of probability expressions by New Zealand standard setters. *Accounting Horizons*, 11 (4), 16-23.

Laswad, F., and Y.T. Mak (2000). Interpretations of probability expressions: a comparison between standards-setters and accountants. *Pacific Accounting Review*, 11 (2), 241-254.

Libby, R. and D.M. Frederick (1990). Experience and the ability to explain audit findings. *Journal of Accounting Research*, 28 (2), 348-367.

Libby, R. and H. Tan (1994). Modeling the determinants of audit expertise. *Accounting, Organizations and Society*, 19 (8), 701-716.

Lichtensten, S. and J.R., Newman (1967). Empirical scaling of common verbal phrases associated with numerical probabilities, *Psychonomic Science*, 9 (10), 563-564.

Lurigio, A.J., and J.S. Carroll (1985). Probation officers' schemata of offenders: content, development, and impact on treatment decisions. *Journal of Personality and Social Psychology*, 48, 112-126.

Marchant, G (1990). Discussion of determinants of auditor expertise. *Journal of Accounting Research*, 28 (Supplement), 21-28.

Martens, S.C. and J.E. McEnroe (1992). Substance over form in auditing and the auditor's position of public trust. *Critical Perspectives on Accounting*, December, 389-401.

Messier, W.F., Jr. (1983). The effect of experience and firm type on materiality/disclosure judgements. *Journal of Accounting Research*, 21 (2), 611-618.

Nelson, M.W. (2003). Behavioral evidence on the effects of principles- and rules-based standards. *Accounting Horizons*, 17 (1), 91-104.

O'Malley, S.F. (1993). Commentary, legal liability is having a chilling effect on the auditor's role. *Accounting Horizons*, 7 (2) 1-7.

O' Reilley, C. J. Chatman and D. Caldwell (1991). People and organizational culture: a profile comparison approach to assessing person-organization fit. *Academy of Management Journal*, September, 487-516.

Ponemon, L.A (1992). Ethical reasoning and selection-socialization in accounting. *Accounting, Organizations and Society*, 17 (3/4), 239-258.

Pratt, J. and P. Beaulieu (1992). Organizational culture in public accounting: size, technology, rank, and functional area. *Accounting, Organization and Society*, 17 (7), 667-684.

Radebaugh, L.H and S.J. Gray (1993). *International Accounting and Multinational Enterprises*. 3rd edition, New York: John Wiley and Sons.

Rapport, A., T.S. Wallsten, I. Erev, and B.L. Cohen (1990). Revision of opinion with verbally and numerically expressed uncertainties. *Acta Psychologica*, 74, 61-79.

Reimers, J., S. Wheeler, and R. Dusenberg (1993). The effect of response mode on auditors' control risk assessments. *Auditing: A Journal of Practice and Theory*, 12 (2), 62-78.

Reimers, J.L (1992). Additional evidence on the need for disclosure reform. *Accounting Horizons*, 6 (1), 36-41.

Schultz, J. and P.M.J. Reckers (1981). The impact of group processing on selected audit disclosure decisions. *Journal of Accounting Research*, 9 (2), 482-501.

Soeters, J. and H. Schreuder (1988). The interaction between national and organizational cultures in accounting firms. *Accounting, Organizations and Society*, 13 (1), 75-85.

Standish, P.E.M (1984). The rationale for accounting standards setting, in *Contemporary Accounting Thought*, ed. Gaffikin, M.J.R., Prentice Hall, 28-54.

Stone, D.N. and W.N. Dilla (1994). When numbers are better than words: the joint effects of response representation and experience on inherent risk judgements. *Auditing: A Journal of Practice and Theory*, 13 (Supplement), 1-20.

Stone, D.R. and R.J. Johnson (1959). A study of words indicating frequency. *Journal of Educational Psychology*, 50 (5), 224-227.

Trotman, K. T (1996). *Research methods for judgments and decision making studies in auditing*, Coopers and Lybrand and Accounting Association of Australia and New Zealand.

Trotman, K.T (1998). Audit judgment research-issues addressed, research methods and future research. *Accounting and Finance*, 38 (2), 115-156.

Tweedie, D (1991). International accounting standards – difficulties for British standards setters, paper presented at the *1991 Annual Conference of the Accounting Association of Australia and New Zealand*, Brisbane, Australia.

Walawski, J (1995). In search of meaning. *Charter*, Nov, 50-52.

Wallsten, T. S., D.V. Budescu, and R. Zwick (1993). Comparing calibration and coherence of numerical and verbal probability judgements. *Management Science*, 39 (2), 176-190.

Wallsten, T.S (1990a) measuring vague uncertainties and understanding their use in decision making, in *Acting Under Uncertainty: Multidisciplinary Conceptions*, edited by G. M von Furstanberg, Boston, Kluwer Academic Publishers, 377-398.

Wallsten, T.S (1990b). The costs and benefits of vague information, in *Insights in Decision Making : Theory and Applications*, ed. Hogarth, R., Chicago, University of Chicago Press, IL, 28-43.

Wallsten, T.S., A.J. Katz, and D.V. Budescu (1989). Timed Magnitude comparisons of numerical and non-numerical expressions of uncertainty. *Psychonomic Society*, 17 (3), 249-264.

Wallsten, T.S., D.V. Budescu, and I. Erev (1988). Understanding and using linguistic uncertainties. *Acta Psychologica*, 68, 39-52.

Wallsten, T.S., S. Fillenboum, and J.A. Cox (1986). Base rate effects on the interpretation of probability and frequency expressions. *Journal of Memory and Language*, 25, 571-587.

Weber, E.U. and D.J. Hilton (1990). Contextual effects in the interpretation of probability words: perceived base rate and severity of events. *Journal of Experimental Psychology: Human Perception and Performance*, 16 (4), 781-789.

Weinberg, S., D.V. Budescu, and T.S. Wallsten (1988). Decisions based on numerically and verbally expressed uncertainties. *Journal of Experimental Psychology: Human Perception and Performance*, 14 (2), 281-294.

Welton, R.E. and J.R. Davis (1990). Accounting implications of the perceptions of professional ethics: a comparative analysis of American and New Zealand Students. *The International Journal of Accounting*, 25, 268-283.

Wright, S, and A.M. Wright (1997). The effect of industry experience on hypothesis generation and audit planning decisions. *Behavioral Research in Accounting*, 9, 273-294.

Wright, W.F (1988). Audit judgement consensus and experience, in *Behavioural Accounting Research: A Critical Analysis*, ed. Ferris, K.R., 305-308.

Zimmer, A.C., Verbal vs. numerical processing of subjective probabilities (1983). *In Decision Making Under Uncertainty*, ed. Scholz, R.W., Amsterdam, North-Holland, 159-182.