An Information Integration Theory Analysis of Tax Preparers' Perceived Risk of Reporting Aggressively on Clients' Income Tax Returns.

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Louisiana State University and Agricultural & Mechanical College

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AN INFORMATION INTEGRATION THEORY ANALYSIS OF
TAX PREPARERS' PERCEIVED RISK OF REPORTING
AGGRESSIVELY ON CLIENTS' INCOME TAX RETURNS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
in
The Department of Accounting

by
Velmer Carlene Eddlemon
B.S., Northwestern State University, 1967
December, 1996
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ABSTRACT

Prior research shows that income tax return preparers influence the income tax compliance decisions of their clients. Information about the risk that income tax return preparers perceive in reporting aggressively on their clients' income tax returns may help the Internal Revenue Service (IRS) reduce the tax gap that exists in the United States today. This study investigates the cognitive algebra that income tax return preparers use to combine the probability of the IRS's assessing penalties for misstatements on their clients' income tax returns with the consequences (penalties, etc.) of those decisions in forming risk perceptions for reporting aggressively on their clients' income tax returns in both single play decisions (those that affect only one client) and multi-play decisions (those that affect several clients). Information integration theory was used to determine the cognitive algebra that income tax return preparers use to form their risk perceptions.

The subjects were mostly CPAs who are either sole practitioners or partners in small CPA firms. The ANOVA results of a between subjects study reveal that income tax return preparers use an additive model to
combine the probability of an IRS examination and the consequences of the examination in arriving at their perceived risk for reporting aggressively on their clients' income tax returns regardless of the number of clients involved.
CHAPTER 1
INTRODUCTION AND BACKGROUND

Introduction

Tax researchers are interested in the motivations of United States citizens who pay income taxes at levels that most would consider economically irrational (Alm, McClelland and Schulze 1992). Most people do the "right" thing and pay income taxes legally owed. Yet, many others underpay their income taxes for many amoral reasons. The Internal Revenue Service's (IRS) Compliance 2000 program hopes to increase taxpayer compliance from its current 83% level to 90% by the year 2001 without increasing the number of tax returns examined. The IRS anticipates achieving this increased compliance by encouraging taxpayers to follow tax rules through manipulation of the 64 identified variables that influence taxpayers in determining the amount of income tax to pay (Internal Revenue Service 1978). Some of these 64 variables are noneconomic, e.g., the compliance level of their peers, their religious beliefs, ethics, fairness of the law, complexity, age; others are economic factors such as financial need, and sanctions for evading taxes. Besides the influence that these factors have upon
taxpayers' reporting decisions, the amount of risk income tax return preparers associate with aggressively reporting items on clients' tax returns may affect the recommendations preparers make to their clients and, hence, taxpayers' reporting decisions. This study examines the formulation of that risk as it relates to income tax return preparers assuming an aggressive posture on an item that affects only one client's income tax return and assuming an identical posture on the same item on a group of their clients' income tax returns.

The research questions are developed in this chapter. First, the impact income tax return preparers have on their clients' compliance decisions will be discussed. Then the gambling nature of tax avoidance/evasion is addressed. Next, the purpose of the study is presented. Finally, the chapter concludes with a statement of the research questions.

**Preparers' Impact on Taxpayers' Compliance**

Approximately 50% of all income tax returns are prepared by paid income tax return preparers (Internal Revenue Service 1994). With over 100 million income tax returns filed each year, paid income tax return preparers have millions of opportunities to exert significant influence over taxpayers' compliance decisions (Kaplan, Reckers, West and Boyd 1988). Generally, certified public accountants (CPAs) and attorneys are considered to be
taxpayer advocates (Jackson and Milliron 1989). In that role, Klepper, Mazur and Nagin (1991) refer to CPAs and attorneys specializing in income taxes as enforcers/ambiguity-exploiters, implying that professional tax preparers\(^1\) encourage their clients to comply when the tax laws are unambiguous but exploit ambiguous areas by making decisions favorable to their clients in gray areas. Although the final responsibility for a tax return position rests with the taxpayer and not the preparer, most people who engage the services of a CPA or attorney follow the recommendations of the tax professional (Kaplan, Reckers, West and Boyd 1988). Thus the preparer’s attitude toward risk may influence recommendations made to a client and, therefore, the client’s tax compliance.

**The Gambling Connection**

With the exception of the few who elect to evade taxes completely—not file income tax returns—everyone in the United States with income over a given amount voluntarily pays income taxes.\(^2\) The higher the income on

\(^1\)The income tax return preparers of interest in this study are CPAs and attorneys.

\(^2\)The IRS does not send people a statement for income taxes owed such as the statements property owners receive from taxing authorities for property taxes. People voluntarily determine the amount of income taxes to pay (Handelman 1989; Darrell 1961; ABA Commission on Taxpayer Compliance 1988).
a return or the higher the tax bracket a return is in, the greater the likelihood of it containing ambiguous tax issues and of being completed by a paid income tax return preparer (Long and Caudill 1987). The percentage of income tax returns prepared by paid professionals increases as the income and, presumably, the income taxes owed by the taxpayers increase. For example, 87% of the individual income tax returns with income over $200,000 are signed by paid income tax return preparers (Internal Revenue Service 1994).

The CPAs and attorneys who prepare these returns recommend ways to minimize their clients' income taxes. These recommendations result in an immediate tax savings and reduces cash outflows for their clients. However, neither the paid preparers nor their clients are certain of the final outcome of their recommendations until the statute of limitations\(^3\) runs or the Internal Revenue Service (IRS) selects a return for examination and discovers any misstated items. This process is similar to a duplex gamble as shown in Figure 1. First, in a duplex gamble, one determines possible winnings (zero or the

\(^3\)The statute of limitations, the time period during which the IRS can assess additional taxes, expires three years from the due date of the tax return or three years from date of filing, whichever is later (Internal Revenue Code (IRC) §6501(a)).
amount taxes may be understated). Aggressive positions must be taken on ambiguous issues for a taxpayer to win. Unless income tax return preparers assume some risk and exploit the gray areas in favor of their clients, winnings are impossible. Taxpayers can immediately realize "winnings" by reporting aggressively. Any losses are delayed until the IRS completes the duplex gamble by either selecting a specific return for examination or permitting the statute of limitations to run; in which case, the taxpayer has a zero loss.

Figure 1. The Income Tax Gamble
For purposes of this research, assume that adopting a conservative reporting posture and paying one’s lawfully determined tax liability is a null event (i.e., it is neither a gain nor a loss). Then within the context of gambling, aggressive taxpayers may “win” if the IRS does not audit their returns, although the amount they “win” depends upon the risk they are willing to take in preparing their returns. If taxpayers engage paid income tax return preparers, the risk the income tax return preparers are willing to take in preparing their returns will determine the amount the taxpayers may “win.”

Aggressive income tax return preparers “win” by retaining their clients’ goodwill and by obtaining referrals from existing clients. By taking greater risks, i.e., making more aggressive recommendations to minimize their clients’ voluntarily reported taxable incomes, income tax return preparers and their clients “win” more than if the preparers make nonaggressive recommendations.

One way for the IRS to increase compliance through manipulation rather than examination is by decreasing the risk that income tax return preparers are willing to take on their clients’ income tax returns. Congress, with the urging of the IRS, has passed numerous laws since the mid 1970’s that impose penalties on income tax return preparers for assisting in tax schemes that result in tax avoidance or tax evasion. These sanctions
have had limited effectiveness in preventing income tax return preparers from assuming aggressive tax postures on clients' income tax returns (Jackson and Milliron 1986). Therefore, methods other than sanctions are needed to curb income tax return preparers' aggressive reporting on clients' income tax returns. The answers to the following questions may provide insight as to how the IRS may proceed in attempting to decrease the amount of risk income tax return preparers are willing to assume. Which factors and cognitive processes do income tax return preparers employ in deciding how much risk is acceptable? Are these factors and processes the same when determining an acceptable level of risk for one client as for a group of clients?

**Purpose of Study**

The purpose of this study is twofold: (1) to determine if income tax return preparers' risk perceptions can help explain the observed level of "over-compliance," and (2) to examine factors that may affect income tax return preparers' formulation of risk perceptions. Prior research shows that people are apt to follow the tenets of von Neumann and Morgenstern's (1944) expected utility theory to make decisions which are duplicated several times. However, individuals often violate the axioms of expected utility theory when confronted with unique, one-time decisions (Diamond 1988; Ghosh and Crain 1993;
Kahneman and Tversky 1979; Lichtenstein 1965; Lopes 1981; Mowen and Mowen 1991; Prelec and Loewenstein 1991; Slovic, Fischhoff, and Lichtenstein 1988). This suggests that income tax return preparers may make decisions regarding issues concerning only one client differently from those applicable to several clients. If income tax return preparers viewed reporting decisions on several clients' tax returns as one in a series of decisions (multi-play tasks), and the reporting decision on a single return as a one-time decision (a single-play or isolated task), then the type of decision and the cognitive algebra income tax return preparers use may explain the recommendations made to their clients. This, in turn, may explain taxpayers' adherence to or rejection of expected utility theory axioms and, therefore, the payment of income taxes at economically irrational amounts.

**Research Questions**

The first research question of this study is: Do income tax return preparers use the same cognitive algebra to assess perceived risk when making decisions that affect only one client as when making decisions that affect several (10) clients? Information integration theory (Anderson 1981 and 1982) provides the basis for determining the cognitive model income tax return preparers use to assess their perceived risk of reporting aggressively on their clients' income tax returns. The
effect, if any, that the probability of the IRS's assessing penalties and the related potential financial losses have upon income tax return preparers' perceived risk of reporting aggressively on their clients' income tax returns will be addressed by the second research question: Do the probabilities of the IRS's assessing penalties and the amount of those potential penalties influence income tax return preparers' perceived risk of assuming an aggressive posture on a tax issue?

The most important contribution this experiment will make is that income tax return preparers seeking to minimize their own potential losses may take conservative positions when making multi-play decisions but take more aggressive positions when making unique decisions. Further, this study will explicitly investigate the cognitive algebra income tax return preparers use to make tax related decisions.
CHAPTER 2
LITERATURE REVIEW

Introduction

There are two categories of models associated with decision making under uncertainty—multiplicative expectancy models and nonmultiplicative heuristic models (Joag 1985). Since Bernoulli (1738) first proposed the idea that people have decreasing marginal utility for money, several expectancy theories/models have been proposed for decision making under uncertainty. The most frequently cited expectancy models are those of expected utility (EU) theory (von Neumann and Morgenstern 1944), subjective utility theory (Edwards 1955; Coombs, Bezembinder, and Goode 1967), subjective expected value (Preston and Baratta 1948), and prospect theory⁴ (Kahneman and Tversky 1979).

However in real life, people consistently violate the axioms of expectancy theories when making decisions.

⁴Although prospect theory, Kahneman and Tversky’s (1979) solution to the observed anomalies in expected utility theory, differs from traditional expectancy theories in several ways, it is analogous to the other expectancy theories in that it requires the weighted probability of an outcome be multiplied by its value to determine the expected value of a prospect.

In an attempt to explain these violations, several heuristic models for decision making under uncertainty have emerged. This chapter reviews the literature for both models but focuses on the literature for the heuristic models. Literature pertinent to expectancy models, heuristic models, the application of these models to both repeated decisions and unique decisions, and the formulation of risk perceptions are discussed in this chapter. The latter part of the chapter reviews three single factor heuristic models germane to tax preparers' decision making and risk perceptions in multi-play and single play decisions.

**Expectancy Models**

Economics' "rational man" bases decisions on the expected outcomes of each alternative and selects the alternative with the highest expected value (von Neumann and Morgenstern 1944). To calculate the expected value (utility or expectancy) of an outcome, multiply the value of each potential outcome by its probability and sum over all possible outcomes. The basic model is:

\[
C = \sum P \times O
\]

\^5In this paper, outcome is often used to denote a random variable. The expected value of a random variable is calculated by multiplying each possible value of the random variable by its probability of occurrence, and then summing over all possible values.
\[ E[V] = \sum_i (P_i \cdot V_i) \], where \( P_i \) = probability of the \( i \)th outcome, \( V_i \) = dollar value of the \( i \)th outcome, and \( \sum_i P_i = 1 \). To apply expectancy theory to decision making, one evaluates all possible alternatives in terms of the expected values of the outcomes. Expectancy theories posit that a rational person makes decisions to maximize utility (i.e., selects the outcome with the highest expected value).

Researchers observed that in certain situations real human beings did not act like the "rational man" when making decisions. These researchers proceeded to develop variations of von Neumann and Morgenstern's expected utility theory. In recent years, prospect theory (Kahneman and Tversky 1979) has been the most popular of the expectancy theories for behavioral studies concerning taxpayers and tax preparers (Alm, McClelland and Schulze 1992; Dusenbury 1994; Martinez-Vazquez, Harwood and Larkins 1992; Newberry, Reckers, and Wyndelts 1993; Robben, Webley, Elffers and Hessing 1990; Sanders and Wyndets 1989; Schadewald 1989; and Schepanski and Kelsey 1990). Prospect theory is based on von Neumann and Morgenstern's (1944) expected utility theory. It differs from expected utility theory in that the probability of each outcome is subjectively weighted and utility is measured as the change (gain or loss) from the current reference point rather than on one's final asset position.
Tax related studies based on prospect theory have mixed results. Several studies will be discussed later in this chapter that support expectancy theories. Heuristic models that have been developed to explain the behavior of individuals that fail to follow the expectancy models will be discussed in the next section.

**Heuristic Models**

Heuristic models of decision making under uncertainty often focus on a single aspect of an outcome. In other cases where outcomes manifest certain characteristics, a combination of aspects may be considered. Regret theory (Bell 1982; Loomes and Sugden 1982), information integration theory (Anderson 1974a, 1974b, 1974c, etc. summarized in Anderson 1981 and 1982), outcome variance (Bruner and Tajfel 1961; Popielarz 1967; Schiffman 1972), recency effects (Kogan and Wallach 1964; Lopes 1976), and multidimensional stimuli which depend upon the decision maker’s personal preferences in regard to over- or under-weighting probabilities and outcomes (Slovic 1967; Slovic and Lichtenstein 1968a, 1968b) are some nonmultiplicative models proposed as descriptive alternatives to expectancy models. Heuristic models do not assume that the decision makers combine probabilities and values multiplicatively but rather treat both probabilities and values as independent dimensions of the perceived risk of an outcome (Joag 1985).
Multi-Play Decisions

When one views a decision as one of a series, he/she is more likely to follow expectancy theories and choose the outcome with the highest expected value. The average actual payoff of a gamble converges to its expected value in the long run (Mood, Graybill, and Boes 1974; Lapin 1987). People associate inconsequential risk with choosing the highest expected value because the weak law of large numbers applies in the long run. Therefore, choosing the alternative with the highest expected value in multi-play decisions approximates a riskless decision. Table 1 lists several studies that support the applicability of expectancy theories to multi-play conditions.

All of the studies listed in table 1 include test of expectancy theories except Combs and Bowen (1971). Combs and Bowen found that in addition to the expectation and variance of a gamble, risk was a function of a transformation on odds when subjects performed the task multiple times. The subjects were given both a numerical and a pictorial distribution of the outcomes of a gamble to be played once and for the same gamble to be played 24 times. The subjects ranked the gambles according the riskiness of the gamble.
## TABLE 1

Articles Showing Differences in Single-play And Multi-play Decisions

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Difference in Single-Play and Multi-Play Decisions</th>
<th>Support for Expected Utility Theory</th>
<th>Single-Play Dominant Factor</th>
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<tr>
<td>Coombs and Bowen 1971</td>
<td>Yes</td>
<td>(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Joag, Mowen and Gentry 1990</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Keren and Wagenaar 1987</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Lopes 1981</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Montgomery and Adelbratt 1982</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wedell and Böckenholt 1990</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

(a) Not tested by referenced study.

In a purchasing experiment, Joag, Mowen and Gentry (1990) ask subjects to indicate the perceived risk associated with making the purchase of a single item that cost $X and with the purchase of 100 items that in total cost the exact number of dollars. The subjects perceived the risk associated with the single item to be far greater than that associated with the group of items.
Single-Play Decisions

When individuals play a gamble or make the same decision many times, they rely upon the expected value of the outcomes to assess the risk associated with the gamble. In the short-run (single-play), an uncertain outcome is seldom equal to its expected value. Furthermore, when there are only two possible outcomes, a single outcome can never equal its expected value. Consequently, a decision maker may not rely upon expected value when making a unique decision. A single factor germane to an uncertain outcome may dominate the assessment of risk for a gamble played only a few times, e.g., in a nonmultiplicative model of decision making under uncertainty. Therefore, people who view a decision as a single, isolated incident may not follow expected utility theory because other factors may influence their risk perceptions and decisions (see table 1).

Risk Perception

Risk and uncertainty are important factors in both normative (expectancy) and descriptive (heuristic) models of decision making. Therefore a discussion of these factors will assist in understanding decision making. Risk is the possibility of loss, disadvantage or damage; it is the subjective estimation of loss as measured by the decision maker (Webster's Third New International Dictionary, s.v. "risk"). According to
Kaplan and Garrick (1981), risk differs from uncertainty: while uncertainty is always a part of risk, risk is not essential to uncertainty. Uncertainty is the absence of information or lack of knowledge about an event, an outcome, etc. (Rowe 1977). For instance, assume that you expect to receive an inheritance; you may be uncertain of the amount that you will receive but you are not at risk. Whereas, uncertainty is applicable to both positive and negative outcomes, only bad (negative) outcomes count in assessing risk (Pope 1983). Thus, risk involves both uncertainty and damages (Kaplan and Garrick 1981).

Risk analysis involves a set of triplets: (1) \( s_i \), the scenario, (2) \( p_i \), the probability of that scenario, and (3) \( x_i \), the consequences or evaluation measure of that scenario (Kaplan and Garrick 1981). Kaplan and Garrick (1981, 13) suggest that to analyze risk using their model, one needs answers to three questions:

(i) What can happen? (i.e., What can go wrong?)
(ii) How likely is it that that will happen?
(iii) If it does happen, what are the consequences?

These questions are pertinent during the decision-making process in which the decision maker forms risk perceptions prior to the decision. This study uses Kaplan and Garrick's (1981) symbolic equation for risk:

\[
\text{Risk} = \text{Uncertainty} + \text{Damages}.
\]
The two basic components of risk—uncertainty (probability) and value of the outcome (damage or reward)—are the basis for both perceived risk and expected value. Generally, one considers expected value as the net long-term desirability or net positive side of an outcome, whereas, one considers perceived risk as the net long-term undesirability or negative side of an outcome (Joag 1985). The perfect decision is the one that maximizes expected value and minimizes risk. If alternative outcomes do not include one with both the highest expected value and the lowest risk, the decision maker may choose an alternative with the most desired feature. If the decision with lower expected value is acceptable, the risk associated with it must also be acceptable (Fischhoff, et al 1981). In addition, someone who wants to minimize perceived risk might utilize a nonmultiplicative model for decision making under uncertainty that focuses on a single aspect of the uncertain outcome to select an alternative.

Several nonmultiplicative models have been proposed to assist in assessing risk. One such model focuses on the probability of the occurrence of a specific outcome (Diamond 1988; Payne and Braunstein 1971). Another model used when the consequences of an outcome or payoff are extremely high, ignores probabilities and focuses on the outcome(s) with the highest consequences (Diamond 1988; Payne and Braunstein 1971).
probabilities and/or expected values are equal, people may focus on a third factor, the variance associated with a given outcome (Lopes 1981; Ghosh and Crain 1993). People may ignore all factors to the exclusion of their most recent experiences, and base all decisions solely on these experiences (Lichtenstein 1965). Finally, the public may make decisions solely on the basis of minimizing their future disappointment or regret (Bell 1982; Loomes and Sugden 1982, 1987). In each of these scenarios, the dominant factors may bias risk perceptions and lead to the selection of an alternative appertaining to the most influential factor. The two factors this study investigates—probability and consequence—both affect risk perceptions and, thus, influence decision making under uncertainty. They are discussed in the following subsections.

**Dominant Factor—Possibility of Coming Out Ahead**

Lopes (1981) argues that in the short-run (single-play), choosing the outcome with the greatest possibility of coming out ahead, rather than the outcome with the highest expected value, is the rational decision. Using the difference between the sampling distributions of

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6 Kogan and Wallach (1964) observed the influence of recent experiences on gamblers' decision making. They found that the final bet of the day is more conservative for both men and women the larger their winnings for the day. Also, adaptation theory (Kahneman and Varey 1989) is closely related to recency effects.
Gamble 1 has greater possibility of coming out ahead in this region.

Gamble I: .75 to win $5; .25 to lose $.10; EV = $3.725; σ = $137.94
Gamble II: 0.005 to win $1,000; 0.995 to lose $1; EV $4,005; σ = $2,232.70.

<table>
<thead>
<tr>
<th>Probability Distribution Area for 1,000 Trials of each Gamble</th>
<th>$3,451 = -2 σ G1</th>
<th>$3,725 = μ G1</th>
<th>$4,005 = μ G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamble 1</td>
<td>2.3%</td>
<td>50.0%</td>
<td>98.0%</td>
</tr>
<tr>
<td>Gamble 2</td>
<td>40.2%</td>
<td>45.1%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

Figure 2. Comparison of Gamble With Greater Possibility of Coming Out Ahead and Gamble With Higher Expected Value

the sum of total winnings for 1,000 trials of two gambles, Lopes (1981) shows that the total winnings for the gamble with the lower expected value exceed the total winnings for the gamble with the higher expected value 57% of the time. These are the results of Lopes' Gamble 1 (0.75 to win $5; 0.25 to lose $.10) which has an expected value of $3.725 and Gamble 2 (0.005 to win $1,000; 0.995 to lose $1) which has an expected value of $4.005. Figure 1 illustrates Lopes' gambles in which the greatest
possibility of coming out ahead is the gamble with the lower expected value. For symmetric wagers, the cumulative gain for a wager with a lower expected value and smaller variance may be larger than the corresponding cumulative gain for a wager with a higher expected value but a greater variance for a large proportion of outcomes. Lopes (1981, 380) advises people "in evaluating gambles, . . . do not consider the large amounts that we are prodigiously unlikely to get, but, rather, consider the amounts we are likely to get most of the time." Lopes concludes that the rational decision for a short-run, unique gamble is the one with the greatest possibility of coming out ahead.

Keren and Wagenaar (1987) conducted two experiments where the subjects chose between two gambles. In one experiment, the subjects play the gamble once; in the other experiment, they play it 10 times. Most of the subjects in the play one-time experiment choose a 99% chance to win $100 and a 1% chance to lose $2 (Gamble 1, expected value $98.98) over a 50% chance to win $250 and a 50% chance to lose $2 (Gamble 2, expected value $124.00), ignoring the fact that the expected value of the latter gamble is more than the former (Keren and Wagenaar 1987). Most subjects in the repeated play experiment selected the gamble with the higher expected value. When they had only one chance to win or lose, subjects preferred the gamble
with the greatest possibility of coming out ahead, which according to expected utility theory is less rational than the one with the highest expected value (Coombs and Bowen 1971; Joag, Mowen, and Gentry 1990).

A large body of literature has developed to explain preference reversals (1) when a gain is restated as a loss and (2) between pricing and choice behavior (Lopes 1981; Keren and Wagenaar 1987; Lichtenstein, Slovic, and Zink 1969; Montgomery and Adelbratt 1982; Wedell and Böckenholt 1990; Mullet 1992; Slovic and Lichtenstein 1968b; Kahneman and Tversky 1979). In Wedell and Böckenholt's (1990) experiment, subjects were asked to choose which bet out of a pair they would prefer to play and to indicate a minimum selling price for each bet in the pair. The lotteries were played 1, 10, and 100 times. When subjects could play a gamble only one time, they chose the gamble with a higher probability of winning a modest amount over the gamble with a low probability of winning a large amount. Contrary to logic, when asked to set a minimum selling price for each gamble, they priced the gamble with the higher probability of winning a modest amount lower than the other gamble. Moreover, as the number of times that subjects play a gamble increases, preference for the bet with the highest probability of winning a modest amount decreases for choice but increases for pricing tasks, whereas the opposite change occurs for
bets with a low probability of winning a large amount. To summarize the findings of Wedell and Böckenholt (1990), subjects prefer the gamble with (1) the smaller probability of losing when the probability of winning \( P_w \) is less than the probability of losing \( P_l \), i.e., \( P_w < P_l \), (2) the greater valued outcome \( S_w \) when \( P_w > P_l \), and (3) the greater \( P_w \) when \( P_w > P_l \) and the amounts to be won are equal. When people are not prejudiced by the probability of an outcome, as these studies suggest, the consequences of the outcome may be the prevailing influence.

Decision makers may believe that they control processes that are, in fact, determined by chance mechanisms (Langer 1975). This is referred to as the illusion of control. People under the influence of the illusion of control believe that "they might 'beat the odds' on a single throw of a die, but not in a series of repeated throws" (Koehler, Gibbs, and Hogarth 1994, 189). Generally, people whose decisions are biased by the illusion of control are aware of the operation of the law of large numbers and accordingly know that they cannot beat the odds in the long-run. Koehler, Gibbs, and Hogarth (1994) found support for the illusion of control hypothesis in single-shot, unique gambles but not in multi-play gambles.
Dominant Factor—Consequences of the Outcome

Radioactive leakage from nuclear power plant accidents, an explosion of liquefied natural gas pipelines, and ozone depletion due to emissions of fluorocarbons are considered to be very dangerous and extremely risky events. Even though the probability of such events occurring is less than $10^{-10}$ (Gutmanis and Jaksch 1984), society does not base its risk perceptions upon the probability or the expected value of such outcomes but upon the consequences of the outcomes. Individuals also may ignore probabilities and expected values when an outcome has extraordinarily high consequences. Expectancy theories (probability times consequence) equate a low-probability/high-damage scenario with a high-probability/low-damage scenario—which Kaplan and Garrick (1981) assert is "definitely not rational."

Payne and Braunstein (1971) found that the most influential factor was the value of the outcome (consequence) when $P_w > P_1$.

The marketing literature is replete with studies of consumer risk perceptions in purchasing decisions for which the consequence of the purchase is low (e.g., as in buying a new brand of cereal) or high (e.g., purchasing an automobile) (Popielarz 1967; Schiffman 1972). In an experimental situation, subjects indicated how favorably they felt about buying a used car with a given probability
that the car would need a certain amount of repairs (Diamond 1988). The probability and amount of repairs for each car were manipulated to create high probability/low consequences and low probability/high consequences conditions. Diamond (1988) concludes that the size of the consequences influences people judging low-probability/high-consequence risk more than the probability of a specific outcome; in fact, people may disregard probability altogether.

**Dominant Factor—Variance of the Outcome**

Variance is a factor that appears to dominate decision making under uncertainty when the probabilities and/or expected values are equal. Subjects choose low variance bets when paid according to the outcome of their actual bets (Lichtenstein 1965). Lichtenstein (1965) suggests that subjects avoided the riskier (greater variance) bets because of their fear of losing money. Just as Lichtenstein's subjects avoided risk, Ghosh and Crain (1993) found taxpayers to be less compliant (more risk seeking) the lower the mean and lesser the range of the perceived probability of an IRS audit.

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7The range is the simplest measure of data variation (Ott 1993). The range can be used to estimate the standard deviation of a sample, i.e., \( s = \frac{\text{range}}{4} \) (Ott 1993).
**Risk Perceptions in Multi-Play vs Single-Play Decisions**

To summarize, risk perception has a significant influence on decision making under uncertainty. Generally, decision makers follow the tenets of expected utility theory when they make recurring decisions. However, when a unique decision is required, decision makers appear to rely on a particular aspect of an outcome (e.g., the probability of a particular outcome or the consequences of an outcome). Whether income tax return preparers follow these general guides when making tax decisions is the topic of this study; it is discussed chapter 3.
CHAPTER 3

HYPOTHESES AND METHODOLOGY

Introduction

The literature reviewed in the preceding chapter is applied to income tax return preparers and the hypotheses of the study are stated in the first part of this chapter. The second part consists of a description of the subjects who participated in the study, an identification of both the dependent and independent variables, an exposition of the proposed covariates, and a discussion of the statistical analysis of the data.

Hypotheses

Income tax return preparers need the answers to Kaplan and Garrick’s (1981) questions to assess the risk they associate with making aggressive recommendations for income tax filings. The first question is: “What can go wrong?” The IRS must examine a client’s income tax return and challenge a position taken on the return for something to go wrong. Then, the IRS must assess the client additional taxes and penalties and/or assess the preparer penalties for something to go wrong.

The second question is: “How likely is something to go wrong?” The likelihood of a particular
tax return being selected for examination by the IRS is unknown. However, the IRS examines less than 1 percent of the returns filed and seldom imposes preparer penalties. The aggressiveness of recommendations income tax return preparers make may be influenced more by their perception of the likelihood of a specific return being examined than by the relative frequency of the return being examined.

Kaplan and Garrick's third question is: "If something goes wrong, what are the consequences?" The negative consequences to income tax return preparers for making aggressive tax recommendations to clients include preparer penalties, damage to professional reputation, loss of the client, and loss of the privilege of preparing income tax returns. The income tax return preparer's loss may be magnified if the preparer pays the penalties the IRS assesses his/her clients. Many income tax

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8 In a recent year, only 80 penalties were imposed on all enrolled agents, CPAs, and attorneys in the United States. A total of 2,392 penalties were levied against all paid income tax preparers (MacDonald 1995; Internal Revenue Service 1995).

9 The IRS assesses income tax return preparer penalties after discovering an understatement due to (1) an unrealistic position or (2) willful, reckless, or intentional conduct on an individual's income tax return (Internal Revenue Code (IRC) §6694). The preparer penalty for taking an unrealistic position is $250 for each return. A $1,000 preparer penalty applies for each return that has a willful, reckless misstatement.

10 The IRS may assess taxpayers the following penalties (IRC §§6651, 6652, 6663):
return preparers pay their clients' penalties if the penalties result from a preparer error or recommendation (MacDonald 1995). Usually, the penalties paid for clients is the largest financial loss or damage professional income tax return preparers incur for recommending aggressive reporting postures.

Risk to income tax return preparers is composed of both the uncertainties associated with the IRS' assessing penalties and the damages preparers suffer. Although income tax return preparers know the overall IRS examination rate, each income tax preparer must determine the "plausibility" of the IRS auditing his/her particular client's return.\(^\text{11}\) After combining the "plausibility" of an IRS audit with related damages, income tax return preparers make recommendations to their clients to

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil fraud</td>
<td>75% of underpayment</td>
</tr>
<tr>
<td>Failure-to-file</td>
<td></td>
</tr>
<tr>
<td>Fraudulent</td>
<td>15% per month up to 75% of underpayment</td>
</tr>
<tr>
<td>Nonfraudulent</td>
<td>5% per month up to 25% of underpayment</td>
</tr>
<tr>
<td>Failure-to-pay</td>
<td>0.5% per month up to 25% of underpayment</td>
</tr>
<tr>
<td>Accuracy related</td>
<td>20% of underpayment</td>
</tr>
</tbody>
</table>

Normally, income tax return preparers pay only the failure-to-pay and accuracy related penalties the IRS assesses their clients.

\(^{11}\)Kaplan and Garrick (1981, 7) distinguish between probability and relative frequency. Probability is subjective: "a numerical measure of a state of knowledge, a degree of belief, a state of confidence"; relative frequency "refers to the outcome of an experiment . . . involving repeated trials." Furthermore, Allais (1983) suggests using the "coefficient of plausibility" in lieu of "probability", because probability is a nebulous, imprecise measure.
minimize their clients' taxable incomes to the extent that the associated risk is acceptable to the preparer. An acceptable level of risk is based upon the uncertainty, monetary value, and nonmonetary value of the outcome (Fischhoff, et al 1981). Nevertheless, income tax return preparers may assess the risk differently for various types of decisions.

**Multi-Play Decisions for Income Taxes**

How income tax return preparers perceive the answers to Kaplan and Garrick's questions depend upon whether each tax decision (gamble) is viewed as a one-time decision or as one in a series of repeated decisions (gambles). If preparers regard these decisions as one in a series of decisions, then preparers are expected to use expectancy theory to make decisions. Therefore, economically rational income tax return preparers should make aggressive recommendations so that their clients pay only a minimal amount of taxes. Yet most people pay close to their fair share of (legally owed) income taxes (Chang, Nichols, and Schultz 1987). This suggests that income tax return preparers may view decisions in ambiguous tax areas as either one-time gambles or as one in a series of gambles.

Income tax return preparers may view reporting decisions as multi-play or single-play events. Prior research based upon monetary gambles shows that people may
be more aggressive when playing a gamble many times than when playing a gamble only once (Joag, Mowen and Gentry 1990; Keren and Wagenaar 1987; Lopes 1981; Montgomery and Adelbratt 1982; and Wedell and Böckenholt 1990). This may be partly due to the fact that most gambles examined in the literature involve large potential gains that may never be realized in the short-run. However, the opposite effect occurs in a tax setting: aggressive tax recommendations involve large potential losses to the taxpayer and the preparer that may never be realized in the short-run. In the long-run, the law of large numbers will operate; accordingly, income tax return preparers anticipate a "large loss" if the gamble is played repeatedly and a return is eventually audited. The greater the number of returns with an aggressive reporting posture a preparer completes, the greater the likelihood that the IRS will select at least one of those returns for examination. Further, IRS regulations prohibit use of the "reasonable cause and good faith" exception for imposing penalties if there is "a pattern of errors . . . or repetition of the same or similar errors on numerous returns" (IRC Reg. §1.6694-2(d)(4)). Therefore, contrary to prior research, income tax return preparers may perceive greater risk in a situation viewed as a repeated play.
Single-Play Decisions for Income Taxes

Income tax return preparers may doubt that recommending an aggressive position in a single-play event will precipitate the assessment of preparer penalties. They are likely to believe that "winning" (i.e., not losing) is more likely in a single-play event because of the minuscule number of returns the IRS examines each year. Thus income tax return preparers may make more aggressive recommendations for unique situations because they associate less risk with a short-run (single-play) event. While people generally may be overly conservative in the short-run, downplaying the importance of large, but improbable gains, income tax return preparers may be overly aggressive in the short-run, disregarding the possibility of large, but improbable losses.

The first hypothesis for this study deals with the difference in the risk associated with single-play and multi-play decisions. An income tax return preparer may make more aggressive recommendations for decisions viewed as an isolated occurrence because they associate less risk with a short-run (single-play) event.

\[ H_{A1}: \] Income tax return preparers will perceive less risk for reporting aggressively for a single-play decision than for multi-play decisions when the potential losses to the preparer are identical.
The second purpose of this research is to examine how income tax return preparers make risk assessments, i.e., to examine the cognitive algebra that income tax return preparers use to formulate tax recommendations. Information integration theory (Anderson, 1959, 1954, 1974a, etc., summarized in Anderson, 1981 and 1982) provides the means to examine the cognitive process used in making risk assessments.

The difference in risk hypothesized in the first hypothesis is expected to be related to the cognitive algebra used by preparers to assess that risk. When a gamble is viewed as one of several, it is expected that preparers will use a multiplicative model. This hypothesis examines the difference in processes used across the two types of decisions. Income tax return preparers, using a multiplicative model to assess risk, multiply the uncertainty of the IRS' assessing a penalty by its damages. When the probability of the IRS' assessing a penalty is low, the perceived risk will be low. As the probability of the IRS' assessing a penalty increases, ceteris paribus, perceived risk will increase. If the probability is being crossed by the damages, however, the risk associated with a large penalty (consequence) will increase faster than the risk associated with a small penalty resulting in a diverging fan shape as shown in panel A, figure 3 (i.e., the
difference in perceived risk between small and large penalties will increase as the probability of the IRS' assessing a penalty increases). The difference between the risk perceived for large and small penalties for repeated decisions will be greatest when the probability of the IRS' assessing a penalty is high. Income tax return preparers are expected to use a multiplicative model for repeated decisions. The second hypothesis is:

\[ H_{A2} \]: Income tax return preparers will combine information on probabilities and damages consistent with a multiplicative model when making multi-play decisions.

For single-play decisions, income tax return preparers are expected to forego a multiplicative model and instead, may either (1) add the probability of the IRS' assessing a penalty to the damages (see panel B, figure 3) or (2) ignore the probability of the IRS' assessing a penalty (see panel C, figure 3). Perceived risk will increase slowly as shown in panel B, figure 3 as the probability of a penalty increases if an additive model is used and probability is added to consequence to determine total perceived risk. If the probability of the
Figure 3. Perceived Risk of Reporting Aggressively on Income Tax Returns

Probability of the IRS' Assessing Penalties

Panel A - Multiplicative Model

Panel B - Additive Model

Panel C - Probability Ignored in Additive Model

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IRS' assessing a penalty is ignored, i.e., probability is assigned a value of zero, and if the income tax return preparer uses an additive model, the perceived risk will remain constant when probability is manipulated (see panel C, figure 3). When probabilities are ignored, risk perceptions are independent of the probability of the IRS' assessing penalties. Income tax return preparers are not expected to use a multiplicative model for single-play decisions. The third hypothesis is:

\[ H_{A3} : \] Income tax return preparers will combine information on probabilities and damages consistent with an additive model when making single-play decisions.

The source of the data and the statistical analysis used to test the three hypotheses of this study are discussed in the next section.

**Methodology**

**Overview of Task**

Subjects will assess their perceived risk of recommending aggressive reporting positions on a client's tax return and indicate whether they would report aggressively in an ambiguous situation in a laboratory experiment. The ambiguous tax topic involves prepaid health care expenses. Subjects will complete the instrument while attending continuing professional education courses, by mail, or by facsimile. The study
will utilize a 2 x 2 x 2 between subjects design. The test instrument will consist of a case scenario, a monetary and ethical risk preference instrument, and a demographic questionnaire. Subjects will also be furnished a summary of the relevant tax authorities along with a complete copy of the relevant Internal Revenue Code and Regulations sections, and a complete copy of a court case.

**Subjects**

Subjects for this investigation will be income tax return preparers employed by CPA or law firms who are either attending continuing professional education courses or were selected at random from the current edition of the Yellow Pages of several major cities. Approximately 300 subjects will participate in this study.

**Independent Variables**

The independent variables for this study are (1) type of decision (single or repeated), (2) probability (high or low), and (3) negative consequence of the outcomes (large/high or small/low). The same three independent variables are used for all three hypotheses.

**Type of Decision.** The two types of decisions (single or repeated) will be operationalized by giving one-third of the subjects questions concerning perceived risk about one client's income tax return and the other
two-thirds questions about several clients' income tax returns. The wording of the manipulation will be:

**Single-play:** None of your other clients have this type of deduction this year.

**Multi-play:** At least 10 of your clients have a similar type and amount of deduction this year.

**Probability.** H_{A2} and H_{A3} postulate that income tax return preparers combine the probability of a negative consequence with the value of reporting aggressively in making decisions and assessing risk. The manipulation of the probability of the IRS' assessing a penalty is essential for observing whether income tax return preparers follow expectancy theories. The probability of the IRS' assessing a penalty will be manipulated at two levels: (1) high—item of income or deduction is of great interest to the IRS District Director and (2) low—income or deduction item is not of interest to the IRS District Director. Professional income tax preparers may balk at making a decision without obtaining a private letter ruling especially in the high consequence/high probability condition. To encourage the subjects to make a decision, the item will be one for which "the Service will not issue advance rulings or determination letters. . . . because those matters are under extensive study" (Rev Proc 95-3). This independent variable will be operationalized as follows:
**High Probability:** The IRS District Director for your area was recently quoted as saying, "We (the IRS in your district) will actively pursue overly aggressive deductions for medical care extending beyond one year even though the National Office is not making advance rulings on this issue."

**Low Probability:** The IRS District Director for your area was recently quoted as saying, "We (the IRS in your district) believe that the interests of taxpayers, income tax return preparers, and the government are best served by waiting until the National Office completes its study of issues, e.g., medical care extending beyond one year before committing resources to those areas. When the National Office refuses to issue advance rulings, any additional taxes we (the IRS) may collect may be refunded following completion of the National Office’s study."

**Negative Consequences.** The IRS can assess income tax return preparers penalties.\(^{12}\) In addition to the preparer penalties, costs imposed on the preparers’ clients may be relevant especially if the clients’ cost are internalized by the preparer as sometimes happens. When CPAs make errors or recommend aggressive tax positions that result in the IRS’ assessing their client penalties, CPAs may also pay the penalties the IRS assesses their clients. Negative monetary consequences to the preparers will be operationalized at two levels, large/high and small/low. The taxpayer will be subject to

\(^{12}\)There are two basic types of preparer penalties—the unrealistic position penalty which is $250 and the willful, reckless, or intentional conduct on an individual’s tax return penalty which is $1,000 (IRC §6694).
only the late payment penalty of 0.5% per month in the small/low consequence condition. The amount for the small/low consequence condition is $150 ($1,500 tax underpaid times 20 months\textsuperscript{13} at 0.5% per month underpayment penalty). In the large/high consequence condition, the taxpayer will be subject to both the 20% substantial understatement penalty and the 0.5% per month late payment penalty that will total $5,000 ($16,700 tax underpaid times 20% substantial understatement penalty plus 20 months at 0.5% per month underpayment penalty).

Assessment of the substantial understatement penalty makes it more difficult for the preparer to invoke the good faith exception to the levy of preparer penalties. Since the amount of the tax related to the income or deduction (instead of the amount of the income or deduction) will be used, the need for tax rates and the related bias will be eliminated. While subjective (nonmonetary) consequences are relevant to tax issues, the author assumes that most income tax return preparers will suffer the same intensity of nonmonetary consequences regardless of the amount of the monetary consequences.\textsuperscript{14}

\textsuperscript{13}The underpayment penalty generally runs from the due date of the return, April 15, until the examination of the return is completed. Most examinations are completed within two years, which is 20 months after the due date of the return.

\textsuperscript{14}This is not true if the preparer incurs fraud penalties. However, this study does not include variable
It may be argued that one potential loss of $5,000 is not equivalent to 10 potential losses of $500 each. On the other hand, one may argue that the risk perceived for a single potential loss of $5,000 is not comparable to that perceived for a potential loss of $50,000 (10 possible losses of $5,000 each). However, if the difference in the perceived risk between a one-time loss of $5,000 and 10 losses of $500 is similar to and in the same direction as that between the one-time loss of $5,000 and 10 repeated losses of $5,000, the argument will not be applicable to this study. Therefore, a control group is used to manipulate the negative consequences in the multi-play condition two ways. In the first manipulation, the subjects will assess the perceived risk for 10 clients reporting aggressively when each client has the same potential penalty as the client in the single-play condition. The potential penalty for each of the 10 clients in the control group will be one-tenth of that for the client in the single-play condition. The wording for the manipulation of this independent variable is:

**Large/High Consequence:** This deduction will reduce your client’s (clients’) income taxes by $16,700 ($1,670). . . . Your client (clients) may be assessed a penalty of $5,000 ($500) if this deduction is disallowed.

**Small/Low Consequence:** This deduction will reduce your client’s (clients’) income taxes

manipulations that are likely to be subject to fraud penalties.
by $1,500 ($150). . . . Your client (clients) could be assessed a penalty of $150 ($15) if this deduction is disallowed.

Dependent Variables

Two dependent variables will be measured. The first is the perceived risk associated with reporting aggressively on a tax return (single return or several returns). The subjects will mark their responses to a case scenario applicable to the hypotheses on a Galton bar scale anchored by "very low risk, 0" and "very high risk, 100" as displayed below:

<table>
<thead>
<tr>
<th>Very Low Risk</th>
<th>Very High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>!............!</td>
<td>!............!</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Using both an "attractiveness" scale (e.g., very low risk) and a "numerical scale" (e.g., 0, 100) removes the bias toward probability in the attractiveness scale and toward money in the numerical scale (Mullet 1992). A continuous scale divided into 100 points, similar to the one above, was used by Troutman and Shanteau (1976) to measure the risk and preference for an alternative in a study of decision making under uncertainty. Joag (1985) used the Galton bar scale to measure perceived risk in an industrial purchasing experiment.

The second dependent variable will indicate whether the subjects would, in fact, report conservatively or aggressively. For example:
Do you recommend taking the deduction on this (all these) client's(s') tax return(s)?

Yes__________  No______________

Covariates

By building extraneous variables into the research design, one can obtain additional information about the effect of the variables on the dependent variables and achieve control (Kerlinger 1986). Both financial and ethical risks are applicable to income tax decision making. Jackson and Milliron (1986) report that 15 of 16 studies that included ethics as a variable found that increasing the magnitude of the compliance variable (ethics) was associated with higher levels of voluntary tax compliance; the results of the other study were indeterminate.

Beck, Davis, and Jung (1991) found that risk-neutral subjects made different tax reporting decisions than risk-averse subjects. Therefore, this study will control for both the financial and ethical risk preferences of the subjects. Risk seeking subjects will perceive less risk associated with both single-play and multi-play decisions than risk neutral subjects. Conversely, risk averse subjects will perceive a greater risk in both conditions. Subjects with extreme risk preferences will mask the effects due to type of decision
because the variability between subjects will cause risk perception for a single client decision and multi-client decisions to be coincident (Montgomery 1991). Therefore, it is imperative to control for risk preferences. The author will discern whether the subjects are risk-neutral, risk-seeking, or risk-averse by using the portion of the Jackson Personality Inventory relating to risk and ethics (Jackson 1994).

In addition to the possible risk covariates, the age, size of firm, household income, and gender of the income tax return preparer will be tested for covariation with the dependent variable, perceived risk.

**Statistical Analysis**

Results of the study will be analyzed using analysis of covariance (ANCOVA) and logistic regression (logit). Analysis of variance (ANOVA) will be used if the proposed covariates are insignificant or do not meet the assumptions of ANCOVA.

**H_{A1} Support.** H_{A1} will be supported if those making decisions for one client are more aggressive (perceive less risk) than those making decisions for several. This will be evidenced by a significant main effect for type of decision.

**H_{A2} Support.** Subjects will use a multiplicative model for decisions applicable to several clients and an additive model for those applicable to only one client.
In general, the test for a multiplicative model using information integration theory requires the finding of (1) significant main effects for probability and consequences, (2) significant consequences by probability interaction, (3) significant interaction in the bilinear component, and (4) nonsignificant residual components. If the consequence by probability interaction is nonsignificant, one rejects the multiplicative model in favor of a nonmultiplicative model (Anderson 1982; Shanteau 1984). The means of the data will plot as diverging fan shaped lines for multiplicative models.

**Hₐ₃ Support.** No probability by consequence interaction in decisions applicable to only one client will provide support for an additive model. The means of the data will plot as parallel curves for additive models.

The penultimate chapter reports the demographical characteristics of the CPAs and attorneys who participated in this study concomitant with the results of the statistical analyses of the data.
CHAPTER 4
RESEARCH RESULTS

Introduction

This chapter presents the results of the statistical tests made to determine whether empirical data support the hypotheses of this study. First, a demography of the tax preparers is presented. The results of tests establishing that the subjects were randomly assigned to each group will follow the discussion of the demography. The final section of this chapter will incorporate both measures of perceived risk in a discussion of the tests of the hypotheses.

Descriptive Data

The hypotheses generated in the preceding chapter apply to the population of subjects who could suffer financial losses as a result of their decisions, i.e., sole practitioners and partners in small CPA firms rather than employees of large international accounting firms. For the manipulation of the variables to be salient, the tax preparers must regard the risk they associate with their decisions as personal risk, believe that the tax issue is both valid and ambiguous, and base their decisions upon the scenarios stated in the case.

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Therefore, the subjects' attitude toward the risk they perceive for themselves, the believability of the tax issue, the ambiguity of the tax issue, and their prior experience with prepaid medical deductions will be addressed following the discourse on said subjects.

**Demographics of Subjects**

In total 244 tax preparers participated in this study: 182 participated in the primary study and an additional 62 participated in the control group. The total includes 140 attendees of two-day professional development income tax seminars sponsored by state CPA societies. The other 104 subjects were randomly selected from local CPA firms listed in the *Yellow Pages* of four major cities in Texas and one in Louisiana. Most of the multifarious subjects practice public accounting in Texas or Louisiana. A few of the subjects are tax attorneys. Demographics for the income tax return preparers who participated in the study are summarized in table 2.

Despite their somewhat diverse demographics, most of the subjects do, in fact, bear the financial burden of their decisions, since 32% are sole practitioners who have no professional employees and another 24% are either sole practitioners who have one or two professional employees or are partners in firms consisting of one or two professionals besides themselves. The average age of the subjects is 45.8 years and ranges
TABLE 2

Summary of Subject Demographics Based Upon The Number of Responses For Each Characteristic

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number of Subjects(^a)</th>
<th>Percent of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>68</td>
<td>28.2</td>
</tr>
<tr>
<td>Male</td>
<td>173</td>
<td>71.8</td>
</tr>
<tr>
<td><strong>30 and Under</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 - 40</td>
<td>18</td>
<td>7.5</td>
</tr>
<tr>
<td>41 - 50</td>
<td>65</td>
<td>26.9</td>
</tr>
<tr>
<td>Over 50</td>
<td>69</td>
<td>28.6</td>
</tr>
<tr>
<td><strong>Tax Experience (Years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Than 6</td>
<td>19</td>
<td>8.1</td>
</tr>
<tr>
<td>6 - 10</td>
<td>32</td>
<td>13.7</td>
</tr>
<tr>
<td>11 - 20</td>
<td>88</td>
<td>37.6</td>
</tr>
<tr>
<td>Over 20</td>
<td>95</td>
<td>40.6</td>
</tr>
<tr>
<td><strong>Size of Firm (Number of</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 3</td>
<td>119</td>
<td>56.1</td>
</tr>
<tr>
<td>4 - 10</td>
<td>43</td>
<td>20.3</td>
</tr>
<tr>
<td>11 - 25</td>
<td>28</td>
<td>13.2</td>
</tr>
<tr>
<td>Over 25</td>
<td>22</td>
<td>10.4</td>
</tr>
<tr>
<td><strong>Highest Education Attained</strong></td>
<td></td>
<td></td>
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<tr>
<td>Bachelor’s Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting</td>
<td>154</td>
<td>63.9</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>7.9</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting Or Taxation</td>
<td>23</td>
<td>9.5</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>7.1</td>
</tr>
<tr>
<td>Law Degree</td>
<td>23</td>
<td>9.5</td>
</tr>
<tr>
<td>All Others</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $50,000</td>
<td>37</td>
<td>17.8</td>
</tr>
<tr>
<td>$50,000 and Less Than $100,000</td>
<td>107</td>
<td>51.4</td>
</tr>
<tr>
<td>$100,000 and Over</td>
<td>64</td>
<td>30.8</td>
</tr>
</tbody>
</table>

\(^a\)The number of subjects shown for each variable may differ because of missing data. The number of subjects in each group is reported in appendix A.
from 23 to 76 years. Household income ranges from $26,500 to more than $500,000, with a mean of $101,120 and a median of $90,000. While over 25% of the subjects hold an advanced college degree, the highest level of education completed for 71.8% of the subjects was a bachelor’s degree. The highest level of education completed ranges from high school to completion of all the course work for a doctoral degree.

The subjects were randomly assigned to the 12 groups used in this between subjects study. The model used to test random assignment of subjects was:

\[
\text{Demographical Variable} = \text{Dec_Type} + \text{Prob} + \text{Cons} + \text{Prob} \times \text{Prob} + \text{Prob} \times \text{Cons} + \text{Dec_Type} \times \text{Prob} \times \text{Cons}.
\]

Panel A, table 3 displays the mean and p-value for each characteristic when it was used as the dependent variable in an analysis of variance test to verify the hypothesis that the characteristic is the same for each of the eight

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15 The primary study is a 2 X 2 X 2 factorial. A third classification of decision type, fraction of multiply, was included as a control group. The primary analysis includes only the eight groups of the 2^3 factorial. All analyses are for the primary eight groups unless otherwise stated.

16 In the model, Dec_Type is decision type, Prob is the probability of the IRS’s assessing a penalty, Cons is the monetary consequences to the income tax preparer of penalties assessed by the IRS on the income tax return preparer’s client(s).
TABLE 3
Description of Sample

Panel A: ANOVA

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Primary Study</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Pr &gt; F</td>
</tr>
<tr>
<td>Age</td>
<td>45.8</td>
<td>0.1803</td>
</tr>
<tr>
<td>Size of Firm</td>
<td>11.4</td>
<td>0.1806</td>
</tr>
<tr>
<td>Household Income</td>
<td>$101,120</td>
<td>0.4506</td>
</tr>
<tr>
<td>Years Tax Experience</td>
<td>19.3</td>
<td>0.4766</td>
</tr>
<tr>
<td>Highest Education Attained(a)</td>
<td>1.3</td>
<td>0.6678</td>
</tr>
<tr>
<td>Traditional Values(b)</td>
<td>75.9</td>
<td>0.5449</td>
</tr>
<tr>
<td>Financial Risk(c)</td>
<td>56.0</td>
<td>0.1806</td>
</tr>
<tr>
<td>Number Clients With</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similar Tax Issue</td>
<td>.6</td>
<td>0.1849</td>
</tr>
</tbody>
</table>

Panel B: \( \chi^2 \)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Primary Study</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Pr &gt; ( \chi^2 )</td>
</tr>
<tr>
<td>Gender</td>
<td>0.2697</td>
<td>0.087</td>
</tr>
<tr>
<td>Location</td>
<td>n/a</td>
<td>0.1138</td>
</tr>
</tbody>
</table>

\(a\)Less than Bachelor’s Degree = 0, Bachelor’s = 1, Master’s Degree = 2, Law Degree = 3, More than Master’s Degree = 4.

\(b\)Scale 0 - 100. Higher score indicates more traditional values.

\(c\)Scale 0 - 100. Higher score indicates greater risk propensity.
groups in the "Primary Study" columns and each of the twelve groups in the "Total Sample" columns. Panel B, Table 3 shows the percent of females in the sample and the p-values for chi-square goodness of fit tests for gender and location.

For the primary study, there were no differences in the composition of the groups as to age, gender, size of firm, household income, years of tax experience, level of education, attitudes toward ethical risk (traditional values), attitudes toward financial risk, prior experience with the tax issue, or geographic location of the subjects across the eight groups: the p-values ranged from 0.1803 for age to 0.6678 for highest level of education attained. For the total sample, which included the data for the four control groups (fraction of multi-play decisions groups), the only difference in demographics was in age. The subjects in the fraction of multi-play decision groups (mean age 43.9 years) are significantly younger than those in the multi-play and single play decision groups (mean age 45.8 years). However, the twelve groups did not differ in relevant experience in tax preparation, gender, education, or household income.

The subjects were, in fact, randomly assigned to the twelve groups in this study as shown by the data in Table 3 and appendix A. The second part of the random assignment verification looks at the subjects’ opinions
about the case scenario, etc., which may affect income tax return preparers' perceived risk of reporting aggressively on clients' income tax returns.

**Opinions of Subjects and Other Potential Confounders**

Tests for random assignment of the subjects to the twelve groups based upon their opinions about their personal risk, the believability of the issue (prepaid medical expenses), the ambiguity of the tax issue, and their prior experience with the tax issue will be discussed next. The model used to test the demographical variables for random assignment of subjects to groups discussed in the preceding section was also used to test that the groups were equivalent with respect to the believability and the ambiguity of the tax issue. The chi-square goodness-of-fit test was used to determine the random assignment of subjects based upon their prior experience with the tax issue and their personal risk.

**Personal Risk.** One debriefing question was "Is the amount of risk you perceive for yourself different from that you perceive for your firm? (Explain)." Eighty-six percent of the respondents answered "No." Most of the respondents making comments replied "I am the firm" (partner or sole practitioner). Two other explanations for the subject's risk being the same as the firm's risk are "I sign the tax returns" and "my employee/agency relationship with the firm." Explanations for personal
risk being different from the firm's risk included: an employee has no risk, the firm pays the penalties, the firm carries professional liability insurance, the firm's obligation to clients, partners' take more risk satisfying clients, the firm could lose the client, and the employee has to pay the penalty instead of the firm.

Table 4 reveals that approximately 86% of the respondents believed that their risk and the firm's risk are the same. As expected, the chi-square goodness of fit test reveals that the distribution of subjects who considered their risk to be identical to that of the firm is uniform across all groups for both the primary study (p-value 0.496) and the total sample (p-value 0.533).

**Prior Experience.** For a salient manipulation of the variables, income tax return preparers must base their

<table>
<thead>
<tr>
<th>TABLE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of Random Assignment of Subjects to Groups Based upon Their Opinions and Other Potential Confounders</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel A: $X^2$</th>
<th>Primary Study</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
<td>Percent</td>
<td>Pr &gt; $X^2$</td>
</tr>
<tr>
<td>Personal Risk</td>
<td>Yes = 0; No = 1</td>
<td>86.4</td>
</tr>
<tr>
<td>Prior Experience</td>
<td>86.5</td>
<td>0.725</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: ANOVA</th>
<th>Mean</th>
<th>Pr &gt; F</th>
<th>Mean</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believability</td>
<td>0.6898</td>
<td>0.2925</td>
<td>0.6888</td>
<td>0.3432</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>0.5521</td>
<td>0.7398</td>
<td>0.6616</td>
<td>0.6002</td>
</tr>
</tbody>
</table>
decisions upon the data presented in the case instead of upon their prior experience with medical deduction issues. The subjects were asked to describe their prior experience with similar tax issues. The exact instructions were: "Describe any situations that you have encountered in practice concerning prepaid medical expenses."

This was followed by the question "How many of your clients have had similar tax problems?" Eighty-six percent of the subjects indicated that they had not encountered a similar prepaid medical deduction issue in their practice. Of the 26 subjects who reported having previous experience with the prepaid medical expense issue, 21 reported that the issue had been encountered on less than five of their clients' income tax returns. The other five subjects reported that 10 to 30 of their clients had similar tax problems. A chi-square goodness of fit test was used to test that the proportion of subjects encountering similar prepaid medical deductions in their practices was uniform across all groups. With a p-value of 0.521, for the total sample and 0.725 for the primary study, the similar composition of groups hypothesis was not rejected. This lack of prior experience with the tax issue and equivalent groups leads to the conclusion that the subjects were making decisions based upon the facts presented in the case scenario rather than upon their prior experiences with the issue.
Believability. Besides feeling that a possibility of personal loss exists, the subjects must believe that they are assessing risk for deductions that are plausible for the dependent variable, i.e., perceived risk, to be meaningful. The question in the debriefing portion of the data collection instrument to ascertain this is: "How believable was the issue?" Subjects responded on a six-point (140 centimeters) scale where zero was described as "Very Unbelievable" and six was described as "Very Believable." Since the response scales were arbitrarily set at 140 centimeters, the results were converted to a zero to one scale to eliminate the need for the reader to remember the length of each scale while reading this study.

The mean response for believability of the tax issue shown in table 4 is 0.6898 and did not differ significantly across the eight groups. The mean believability for the eight groups ranged from 0.60 to 0.76. Subjects provided evidence that the scenario was very realistic as 25% marked the highest decile compared to only 3.8% who marked the lowest decile. In total, 72.6% indicated that the scenario was more than 50% believable whereas only four subjects thought it was very unbelievable. An analysis of variance test with believability of the issue as the dependent variable, p-value 0.2925, failed to reject the hypothesis that all
the groups held similar views about the believability of the tax issue. The same conclusions were reached regarding the total sample.

**Ambiguity.** A test of the first possible confounder was necessary to establish that the subjects believed that the tax issue was ambiguous. When there is only one correct way to handle a specific tax item, CPAs are required to report the item correctly on their clients' income tax returns (AICPA 1988). However, CPAs are permitted to take aggressive positions on clients' income tax returns when items are ambiguous.

To ascertain the subjects' attitude toward the ambiguity of the issue, the debriefing section included the question: "Mark the scale below to answer: 'Do you think the scenario is clear cut?'" The six-point (140 centimeters) scale was anchored by zero, "Very Clear Cut Only One Possible Correct Answer," and six, "No Correct Answer." The responses were converted to a zero to one scale to eliminate the need for the reader to remember the scale when reading the results. The mean response was 0.5521. The responses for the single play and multi-play decision type groups ranged from 0.4946 to 0.6238. Only four of the subjects considered prepaid medical expenses not to be an ambiguous tax issue. When ambiguity was used as the dependent variable in the ANOVA model shown in the demographics of subjects section of this chapter, the
p-value was 0.7398 for the eight groups in the primary study and 0.725 for all 12 groups. P-values that large supports the conclusion that ambiguity of the issue was the same for all the groups.

These results suggest that the subjects were making decisions for which they could incur a personal loss, and were basing their decisions upon the facts presented in the test case which they believed were both realistic and ambiguous. This, in turn, leads to the conclusion that the subjects were randomly assigned to the groups in the study and that the results were not confounded by these factors; therefore, the results can be attributed to the independent constructs.

**Hypotheses**

The results of analysis of covariance (ANCOVA) that test the significance of the proposed covariates (ethical and financial risk and four other demographic characteristics) are presented first. This is followed by a brief discussion of the assumptions of ANOVA/ANCOVA and the appropriateness of ANOVA for testing the hypotheses developed in chapter 3. The remainder of this section examines the ANOVA tests of the hypotheses.

**Covariates**

Six characteristics of the subjects were tested for possible covariation with income tax return preparers' perceived risk of reporting aggressively on clients'
income tax returns. A discussion of the subjects' risk propensities will be followed by a discussion of four other characteristics that may influence income tax return preparers' risk perceptions. Table 5 contains the results of a test to determine whether one or more of the covariates should be included in the model to test the hypotheses. The ANCOVA model used to determine if, in fact, preparers' risk propensities and the other four demographic characteristics moderate the perceived risk that income tax return preparers associate with reporting aggressively on clients' income tax returns is:

\[
\text{Perceived Risk} = ERISK + FRISK + \text{Age} + \text{Size} + \text{Income} + \text{Dec}_\text{Type} + \text{Prob} + \text{Cons} + \text{Dec}_\text{Type} \times \text{Prob} + \\
\text{Dec}_\text{Type} \times \text{Prob} \times \text{Cons} + \text{Dec}_\text{Type} \times \text{Cons} + \text{Prob} \times \text{Cons} + \text{Gender}
\]

**Risk Propensities.** The subjects' traditional values, i.e., ethical risk, and financial risk propensities were measured using the combined male and female norms for the percentile equivalents of the JPI-R raw scores. Only 127 observations were included in this test because of missing data for some of the covariates. Neither of the potential risk covariates were significant. When all six of the demographic characteristics are in the model, the p-values, as shown in table 5, are 0.5252 and 0.9837 for traditional values (ERISK) and financial risk (FRISK) respectively. Omitting one risk covariate from the model does not make the other risk covariate significant. The p-value for FRISK is 0.6027 when ERISK
TABLE 5  
Test of Covariates

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>F Value</th>
<th>Pr &gt; F^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>13</td>
<td>33035.221</td>
<td>4.49</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>113</td>
<td>64007.246</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>126</td>
<td>97042.467</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Square</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.V.</td>
<td>0.340420</td>
<td>45.09026</td>
<td>52.783</td>
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</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Type III SS</th>
<th>F Value</th>
<th>Pr &gt; F^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td>1</td>
<td>938.264</td>
<td>1.66</td>
<td>0.2007</td>
</tr>
<tr>
<td>ERISK</td>
<td>1</td>
<td>230.088</td>
<td>0.41</td>
<td>0.5252</td>
</tr>
<tr>
<td>FRISK</td>
<td>1</td>
<td>0.237</td>
<td>0.00</td>
<td>0.9837</td>
</tr>
<tr>
<td>AGE</td>
<td>1</td>
<td>132.956</td>
<td>0.23</td>
<td>0.6290</td>
</tr>
<tr>
<td>SIZE</td>
<td>1</td>
<td>671.749</td>
<td>1.19</td>
<td>0.2785</td>
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<tr>
<td>INCOME</td>
<td>1</td>
<td>2233.167</td>
<td>3.94</td>
<td>0.0495</td>
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<tr>
<td>DEC_TYPE</td>
<td>1</td>
<td>548.511</td>
<td>0.97</td>
<td>0.3272</td>
</tr>
<tr>
<td>PROB</td>
<td>1</td>
<td>2173.849</td>
<td>3.84</td>
<td>0.0526</td>
</tr>
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<td>DEC_TYPE*PROB</td>
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<td>269.652</td>
<td>0.48</td>
<td>0.4916</td>
</tr>
<tr>
<td>CONS</td>
<td>1</td>
<td>27044.285</td>
<td>47.74</td>
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<tr>
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<td>PROB*CONS</td>
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<tr>
<td>DEC_TYPE<em>PROB</em>CONS</td>
<td>1</td>
<td>1.151</td>
<td>0.00</td>
<td>0.9641</td>
</tr>
</tbody>
</table>

^aTwo-tail test.

is omitted. When FRISK is excluded from the analysis, the p-value for ERISK is 0.3800 which is also nonsignificant.

Perfectly correlated variables have a Pearson correlation coefficient of ±1. The Pearson correlation
Coefficient for ERISK and FRISK is -0.23103 which means that ERISK and FRISK are not correlated. The probability of obtaining a coefficient as small as |0.23103| when the variables are correlated is 0.0018. Financial risk (FRISK) and traditional values (ERISK) were not expected to be correlated because items in the JPI-R are not correlated. Since these two covariates are not significant, ERISK and FRISK are excluded from the final model.

**Moderating Effects of Other Characteristics.**

Prior research shows that certain demographic variables influence taxpayers' income tax reporting decisions (Jackson and Milliron 1986). Four of these variables may influence income tax return preparers as well as taxpayers. Three of these variables were included as covariates in the ANCOVA model. The fourth, gender, was included as a classification variable. The results of this analysis are discussed next.

Gender is the first characteristic examined. Generally, males are considered more risk seeking than females. Since females comprised 28% of the subjects in this study and may not be distributed equally across the groups (p-value = 0.087, table 3), the results could be biased if the females perceive more risk than their male counterparts. To test for a gender effect, gender was added to the ANCOVA model as an independent variable. The
results (p-value 0.2007), which are presented in table 5, indicate that females do not perceive more risk than males in reporting aggressively on clients' income tax returns. Neither do the results change when the observations for females are eliminated from the analyses. The conclusion is that there is no difference between males and females in the amount of risk perceived for reporting aggressively on clients' income tax returns.

Another characteristic that prior research shows to be related to reporting aggressively on income tax returns is age. Younger tax preparers' may perceive less risk in taking an aggressive position on a client's income tax return because, generally, their own net worth is lower than that of older tax preparers. Again, age was added to the ANCOVA model as a covariate to test whether age influences income tax return preparers in assuming aggressive postures on tax issues. The results shown in table 5 suggest that age with an alpha value of 0.6290 definitely does not have an impact upon tax preparers' perceived risk of reporting aggressively on clients' income tax returns.

The third characteristic considered in this study that may affect income tax reporting is household income. Generally, the higher the income the greater the opportunity to avoid/evade income taxes. Income tax return preparers' concept of materiality and, therefore,
their perceived risk of reporting aggressively on clients' income tax returns may be affected by their own household income and their own opportunities to avoid/evade income taxes. Thus income tax return preparers with higher incomes and greater opportunities to avoid/evade income taxes may perceive less risk in reporting aggressively on clients' income tax returns than preparers with lower incomes. Household income was significant at the 0.0495 level when included in the model as a covariate (see table 5). This variable in included in the model to test whether the assumptions of ANCOVA are satisfied. The results of this test are discussed later in this chapter.

The fourth demographic characteristic considered is size of firm. The larger the firm the greater the number of professionals to share the damages. Prorating the potential losses among several preparers may lead to lower perceived risk. The results shown in table 5 indicate that size of firm with a p-value of 0.2785 did not have an effect on income tax return preparers' perceived risk of reporting aggressively on clients' income tax returns.

The lack of significance for three of these variables indicates that the amount of perceived risk associated with reporting aggressively on clients' income tax returns is not affected by the subjects' gender, age, or size of firm. Household income of income tax return
preparers, the fourth variable, was significant and may skew the results of the study if the sample is not representative of the entire population of income tax return preparers. The assumptions of ANCOVA and ANOVA as applied to this study are addressed in the following section.

**ANCOVA/ANOVA Assumptions**

Analysis of covariance is used when other quantitative variables affect the response variable (in this case perceived risk) of interest (Ott 1993). The assumptions (on perceived risk) of ANCOVA include those of ANOVA which are: (1) homogeneity of variance, (2) normality, and (3) independence. Besides the three ANOVA assumptions, a fourth assumption, homogeneity of slopes, is essential to obtain valid results from ANCOVA. Each of these assumptions are addressed below.

**Homogeneity of Variance.** Hartley's test for the equality of variances rejects the hypothesis of equal population variances if the test statistic is greater than 4.61 for an $\alpha$-level of .05 for eight groups with a sample size of 20 in each group. $F_{\text{max}}$, the test statistic, for the eight groups in the primary study is 8.07 which is far greater than the 4.61 rejection level. However, if the single play, low probability, low consequence (SLL) group is omitted, the critical value using only the remaining seven groups is 3.94 and the test statistic is 1.77.
Although seven of the eight groups do have equal variances, an additional test was conducted for equality of variances.

Levene's test of homogeneity of group variances "was shown to be nearly as good as Barlett's test and Harltee's test for normally distributed data and superior to them for non-normally distributed data" (Milliken and Johnson 1992, 22). Using all eight groups in the primary study, Levene's test has a p-value of 0.0035 which supports the conclusion that the variances are unequal.

Normality. The Shapiro-Wilk procedure which tests the null hypothesis that the data in all groups are normally distributed, was employed first. The W:Normal test statistic from this procedure for the eight groups has a p-value of 0.0001 which indicates that the data is not normally distributed. Next, each of the groups was separately tested using the Shapiro Wilk procedure. Only two of the eight groups were not normally distributed. ANCOVA and ANOVA are robust to violations of the normality assumption when cell sizes are equal or roughly the same size and variances are roughly equal. "Roughly the same size" means no one group is more than 1.5 times larger or smaller than the other groups (Hays 1994). The smallest group in this study has 17 observations; the largest group has 24. Therefore, the groups in this study are roughly the same size.
In this study, the SLL (single play, low probability, low consequence) group with 17 useable (18 total) observations is the smallest group and, also, has the smallest variance, 67.2529. The group with the largest variance, 669.9644, is the MHL (multi-play, high probability, low consequence) group, which is the second largest group with 22 useable (23 total) observations. The largest group has 24 useable observations. According to Stevens (1990) if the smaller variance is associated with the smaller group and the larger variance is associated with the larger group, as it is in this study, the F-statistic for ANOVA is actually more conservative than usual and the null hypothesis will not be rejected as often as it should.

**Independence.** One of the strengths of between subjects studies is that the observations are independent. Very few of the subjects were from the same firm. The subjects selected from the *Yellow Pages* and those from one of the professional development courses did not have an opportunity to communicate with other subjects prior to completion of the data collection instrument. Therefore one infers that the assumption of independence is met.

**Homogeneity of Slopes.** The SAS procedure Proc GLM was used to test the equality of slopes of the regression equations. Type I sum of squares are used to interpret the results of this test. Type I sum of squares
indicate the amount of variability explained by each variable as it is added to the model. A variable should be included as a covariate “If the covariate is significant and the interaction of the covariate and the main effects is not significant . . .” (University of Texas Statistical Consulting 1993). The p-value for income from the Type I sum of squares when the main effects are already in the model is 0.1215 and the p-value for the highest level interaction term (income X decision type X probability X consequence) is 0.6311. Neither the covariate nor the highest level interaction term is significant. Thus using the University of Texas Statistical Consulting’s test interpretation, the homogeneity of slope assumption has been violated and income does not vary with perceived risk in the manner specified for covariates.

To further test the ANCOVA assumption of equal slopes, a general model allowing for different intercepts and different slopes was fit to the data. The F-test with seven (7) numerator degrees of freedom has a p-value of 0.1885 for the primary study and 0.4356 for the control group. Therefore, one concludes that the slopes are the same and that ANCOVA is the appropriate model to test the hypotheses.

**ANOVA Used.** As discussed in the preceding paragraph, the only significant covariate, household
TABLE 6

Test of Effect of Decision Type, Probability, and Consequence on Income Tax Return Preparers’ Perceived Risk of Reporting Aggressively on Clients’ Income Tax Returns Using ANCOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>8</td>
<td>3,382,15326</td>
<td>7.67</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>135</td>
<td>7,44,00565</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected</td>
<td></td>
<td>10,823,15890</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>10,823,15890</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R-Square C.V. RISK Mean
0.312492 44.02786 0.53323837

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Type III SS</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROB</td>
<td>1</td>
<td>0.29963811</td>
<td>5.44</td>
<td>0.0212</td>
</tr>
<tr>
<td>DEC_TYPE</td>
<td>1</td>
<td>0.06553086</td>
<td>1.19</td>
<td>0.2775</td>
</tr>
<tr>
<td>PROB*DEC_TYPE</td>
<td>1</td>
<td>0.10370473</td>
<td>1.88</td>
<td>0.1724</td>
</tr>
<tr>
<td>CONS</td>
<td>1</td>
<td>2.75170872</td>
<td>49.92</td>
<td>0.0001</td>
</tr>
<tr>
<td>PROB*CONS</td>
<td>1</td>
<td>0.02608036</td>
<td>0.47</td>
<td>0.4927</td>
</tr>
<tr>
<td>DEC_TYPE*CONS</td>
<td>1</td>
<td>0.04552038</td>
<td>0.83</td>
<td>0.3651</td>
</tr>
<tr>
<td>PROB<em>DEC_TYPE</em>CONS</td>
<td>1</td>
<td>0.00737993</td>
<td>0.13</td>
<td>0.7150</td>
</tr>
<tr>
<td>INCOME</td>
<td>1</td>
<td>0.21650085</td>
<td>3.93</td>
<td>0.0495</td>
</tr>
</tbody>
</table>

income, varies with perceived risk in a systematic fashion; therefore, the ANCOVA model is suitable for testing the hypotheses. However, approximately 20% of the subjects failed to report their household income. Using the ANCOVA model to test for significance of the covariate household income was only marginally significant (p-value
0.0495). Comparing the p-values of ANCOVA in table 6 with those of ANOVA in table 7, one arrives at the same conclusions regarding the significance of the three factors (decision type, probability, and consequence) and their interactions. Since ANOVA includes more of the data than ANCOVA (see appendix A), the results of ANOVA are reported. The assumptions of ANOVA will be reviewed next to determine whether ANOVA should be used.

Independence of observations is the only ANOVA assumption that is not violated. Normality and homogeneity of variance hold for six and seven of the groups, respectively. Income tax return preparers' perceived risk was expected to be more homogenous in the SLL (single play, low probability, low consequence) group than the other groups because only one taxpayer is involved and because the SLL group is the one with the smallest penalty and lowest probability of the IRS's assessing penalties. ANOVA is robust to violations of the equal variance assumption if the data is normally distributed. Seven of the eight groups have equal variances and six are normally distributed. Small sample sizes frequently have unequal variances and non-normal distributions, yet they are drawn from populations that are normally distributed and that have equal variances. Although the assumptions of ANOVA are not completely valid for this sample, ANOVA is robust to these particular
violations. ANOVA will be used to test the hypotheses even though the results may be on the conservative side as previously stated.

**Equal Risk Perceived for Single and Multi-Play Decisions**

The first hypothesis predicts that income tax return preparers will perceive more risk for reporting aggressively on ten clients' income tax returns than for reporting aggressively on one client's income tax return when the probability of the IRS' assessing penalties and consequence to the preparer are the same. Perceived risk was measured on a Galton Bar scale anchored by zero, "Very Low Risk" and 100, "Very High Risk". Panel A, table 6 exhibits the effects of decision type, probability of the IRS' assessing penalties, and consequence on income tax return preparers' perceived risk of reporting aggressively on clients' income tax returns. The overall mean of perceived risk is 53.11. The difference in the estimated least squares means for each multi-play decision group and the corresponding single play decision group are -6.36 for the high probability, high consequence groups, 4.24 for the high probability, low consequence groups, 4.81 for the low probability, high consequence groups, and 14.40 for the low probability, low consequence groups. The differences in the estimated means were in the predicted direction except for the high probability, high consequence groups. In a one-tail test, the independent
TABLE 7

Test of Effect of Decision Type, Probability, and Consequence on Income Tax Return Preparers' Perceived Risk of Reporting Aggressively on Clients' Income Tax Returns Using ANOVA

<table>
<thead>
<tr>
<th>Panel A Overall Test</th>
<th>Multi-Play and Single Play Data</th>
<th>Dependent Variable: Perceived Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>DF</td>
<td>Sum of Squares</td>
</tr>
<tr>
<td>Model</td>
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<td>39649.3401</td>
</tr>
<tr>
<td>Error</td>
<td>162</td>
<td>91573.2559</td>
</tr>
<tr>
<td>Corrected Total</td>
<td>169</td>
<td>131222.5961</td>
</tr>
<tr>
<td>R-Square</td>
<td></td>
<td>0.302153</td>
</tr>
<tr>
<td>C.V.</td>
<td></td>
<td>44.76445</td>
</tr>
<tr>
<td>RISK Mean</td>
<td></td>
<td>53.112</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>DF</th>
<th>Type III SS</th>
<th>F Value</th>
<th>Pr &gt; F⁷</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEC_TYPE</td>
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<td>767.9241</td>
<td>1.36</td>
<td>0.2455</td>
</tr>
<tr>
<td>PROB</td>
<td>1</td>
<td>2334.9432</td>
<td>4.13</td>
<td>0.0437</td>
</tr>
<tr>
<td>DEC_TYPE*PROB</td>
<td>1</td>
<td>1193.2636</td>
<td>2.11</td>
<td>0.1482</td>
</tr>
<tr>
<td>CONS</td>
<td>1</td>
<td>36395.7195</td>
<td>64.39</td>
<td>0.0001</td>
</tr>
<tr>
<td>DEC_TYPE*CONS</td>
<td>1</td>
<td>1069.7236</td>
<td>1.89</td>
<td>0.1708</td>
</tr>
<tr>
<td>PROB*CONS</td>
<td>1</td>
<td>57.4863</td>
<td>0.10</td>
<td>0.7502</td>
</tr>
<tr>
<td>DEC_TYPE<em>PROB</em>CONS</td>
<td>1</td>
<td>2.5909</td>
<td>0.00</td>
<td>0.9461</td>
</tr>
</tbody>
</table>

⁷Two-tail test.

<table>
<thead>
<tr>
<th>Panel B - Cell Least Squares Means</th>
<th>High Probability</th>
<th>Low Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consequence</td>
<td>Consequence</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Multi-Play</td>
<td>67.96</td>
<td>42.66</td>
</tr>
<tr>
<td>Single Play</td>
<td>74.32</td>
<td>38.42</td>
</tr>
</tbody>
</table>

variable decision type, with a p-value of 0.1228, is not significant. No difference exists in the perceived risk.
between reporting aggressively for a particular tax item on one client's income tax return and reporting the same item aggressively on ten clients' income tax returns when the probability of the IRS' assessing a penalty and consequence are the same.

When are consequences for financial decisions the same? Is one (single play) decision concerning $500 equivalent to ten $50 or ten $500 decisions (multi-play), i.e., should the amounts of the ten decisions total the amount of the single play decision or should each of the ten decisions be for the same amount as the single play decision? In the gambling studies, a fraction of the single play amount was used so that the expected values of the single play gamble and the multi-play gambles were the same. In the test of the first hypothesis just presented, each multi-play amount was exactly the same as the single play amount. To be consistent with the prior studies, a control group was included in the study for which the consequence amount was one-tenth of the single play amount.

In the multi-play decision type, high consequence (penalty, etc.) was $5,000 and the low consequence was $150, whereas in the control group, the amounts are $500 and $15, respectively. Data from the control group is referred to as fraction of multi-play. An ANOVA table is presented in table 8 in which the
fraction of multi-play data is used instead of the multi-play data. As expected, the mean perceived risk, 47.24, is lower than when the higher multi-play amounts were used in the analysis. Decision type is significant at the 0.0126 level, probability at the 0.0669 level, and consequence at the 0.0001 level in a one-tail test when fraction of multi-play data is included in the analysis. The interactions remain insignificant.

Although there is a main effect for decision type when multi-play consequence is only one-tenth of the single play amount, the difference is not in the hypothesized direction for three of the four groups. Only in the low probability/low consequence group is the estimated mean of perceived risk for single play decisions (27.05) less than that for fraction-of-multi-play decisions (28.09). This difference in the results obtained when data from the control group was used instead of the multi-play data merits further investigation.

**Multiplicative Model Not Used by Tax Preparers**

The second hypothesis tests for the use of a multiplicative information integration theory decision model when income tax return preparers make decisions about assuming an aggressive tax posture on several clients' income tax returns. The hypothesis was tested using the fraction of multi-play observations since there was no difference in the decision model the income tax
TABLE 8
Test of Effect of Decision Type, Probability and Consequence on Income Tax Preparers Perceived Risk for the Control Group

Panel A - Overall Test

General Linear Models Procedure

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>7</td>
<td>37906.6153</td>
<td>11.78</td>
<td>0.0001</td>
</tr>
<tr>
<td>Error</td>
<td>135</td>
<td>62067.3518</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>142</td>
<td>99973.9672</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R-Square</th>
<th>C.V.</th>
<th>Perceived Risk Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.379165</td>
<td>45.38786</td>
<td>47.241647</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Type III SS</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEC_TYPE</td>
<td>1</td>
<td>2357.193</td>
<td>5.13</td>
<td>0.0126</td>
</tr>
<tr>
<td>PROB</td>
<td>1</td>
<td>1046.552</td>
<td>2.28</td>
<td>0.0669</td>
</tr>
<tr>
<td>DEC_TYPE*PROB</td>
<td>1</td>
<td>1852.827</td>
<td>4.03</td>
<td>0.0234</td>
</tr>
<tr>
<td>CONS</td>
<td>1</td>
<td>27640.756</td>
<td>60.12</td>
<td>0.0001</td>
</tr>
<tr>
<td>DEC_TYPE*CONS</td>
<td>1</td>
<td>1375.072</td>
<td>2.99</td>
<td>0.0430</td>
</tr>
<tr>
<td>PROB*CONS</td>
<td>1</td>
<td>291.242</td>
<td>0.63</td>
<td>0.2138</td>
</tr>
<tr>
<td>DEC_TYPE<em>PROB</em>CONS</td>
<td>1</td>
<td>646.626</td>
<td>1.41</td>
<td>0.1189</td>
</tr>
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</table>

*Two tail test.
*One tail test.

Panel B - Least Squares Means

<table>
<thead>
<tr>
<th>Types</th>
<th>High Probability</th>
<th>Low Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consequence</td>
<td>Consequence</td>
</tr>
<tr>
<td></td>
<td>High  Low</td>
<td>High  Low</td>
</tr>
<tr>
<td>Fraction of Multi-Play</td>
<td>48.18  33.48</td>
<td>57.20  28.09</td>
</tr>
<tr>
<td>Single Play</td>
<td>74.32  38.42</td>
<td>60.11  27.05</td>
</tr>
</tbody>
</table>
preparers used to make single play and multi-play decisions when consequence was the same amount for each of the ten clients in the multi-play treatment as for one client in the single play treatment.

If income tax return preparers combine the probability of the IRS' assessing a penalty with consequences multiplicatively, the means of the groups will plot as diverging fan shaped curves. A two factor multiplicative model, for which interaction has more than a single degree of freedom, must have both of the main effects significant, the bilinear interaction component significant, and all residual interaction components.

![Fraction of Multi-Play Decisions](image)

**Figure 4. Perceived Risk of Reporting Aggressively on Clients' Income Tax Returns for Control Group**

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nonsignificant. A multiplicative model of income tax preparers' perceived risk requires significant main effects for consequence and probability of the IRS' assessing a penalty, and a significant consequence by probability interaction.

The control group, fraction of multi-play, does not support $H_{A2}$ neither statistically nor graphically. The main effect for consequence is significant at the 0.0001 level. But the main effect for probability, p-value 0.7309, and the probability by consequence interaction, p-value 0.1750, are not significant. The means plot as converging curves. Figure 4 exhibits the graphs of the estimated cell means of the fraction of multi-play data. The high consequence curve has a negative slope while the low consequence curve has a positive slope. This suggests the use of an information integration theory combination model rather than the multiplicative model predicted in the second hypothesis.

**Additive Model Utilized in Single Play Decisions**

The third research hypothesis postulates that income tax return preparers utilize an additive information integration theory model to make a unique, one time decision that affects only one client. An additive model can be detected both graphically and through statistical tests. Graphically, an additive model plots as parallel curves. Statistically, an additive model has
significant main effects for the independent variables but no significant interaction. When both independent variables are significant, the parallel curves must be either increasing or decreasing. In an additive model, the parallel curves are generally increasing as shown in panel B, figure 3. If the independent variable plotted on the horizontal axis is not significant, the curves will be parallel to the horizontal axis as shown in panel C, figure 3.

The ANOVA results presented in table 9 show that the probability of the IRS' assessing a penalty, PROB, is significant at the 0.0115 level and that consequence, CONS, is highly significant at the 0.0001 level (two tail
Multi-Play Decisions
Consequence Same as Single Play Amount

Figure 5. Income Tax Preparers' Perceived Risk of Reporting Aggressively on One Client's Income Tax Return

tests). The p-value (0.7748) for the PROB*CONS interaction is not significant. Therefore, the statistical requirements for an additive model are met.

Graphically the estimated cell means of the single play groups plot as monotonically increasing parallel curves. The plot of the estimated cell means of the single play decision type groups shown in figure 5 clearly depicts an additive model. These conditions provide support for the third research hypothesis: income tax return preparers combine information on probabilities and damages consistent with an additive model when making unique decisions.
### TABLE 10

Test of Use of Multiplicative Information Integration Theory Model

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Type III SS</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROB</td>
<td>1</td>
<td>100.3221</td>
<td>0.16</td>
<td>0.6924</td>
</tr>
<tr>
<td>CONS</td>
<td>1</td>
<td>13205.2979</td>
<td>20.73</td>
<td>0.0001</td>
</tr>
<tr>
<td>PROB*CONS</td>
<td>1</td>
<td>18.8512</td>
<td>0.03</td>
<td>0.8638</td>
</tr>
</tbody>
</table>

In as much as no difference was detected between the single play and multi-play decision types when the multi-play consequence was equal to the single play consequence amount, the multi-play data was examined to ascertain whether an additive model was used (see table 9). Using multi-play data, there is a significant main effect for consequence (CONS), which has a p-value of 0.0001 (two tail test). However, there is no main effect for probability, p-value 0.6924. The PROB*CONS interaction is not significant (p-value 0.8638).

Therefore, statistically, the multi-play data satisfies the requirements for a special case of the additive model when probability is not significant. Disregarding
probability implies that a constant probability value of zero is added to the value of consequence when income tax return preparers make decisions that affect ten clients. This disregard of probability culminates in the estimated cell means plotting as curves parallel to the x-axis. The curves are plotted in figure 6. In figure 6, the data plots as two parallel curves similar to the graph in panel C, figure 3. No difference in multi-play and single play decision types was detected because an additive model was used to make both types of decisions, albeit, a special case of the additive model was used for multi-play decisions when consequence was the same amount for each of

![Multi-Play Decisions](image)

Figure 6. Perceived Risk of Reporting Aggressively on Ten Clients' Income Tax Returns

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the ten clients as for the one client in the single play condition.

**Perceived Risk Congruous With Recommendations**

Perceived risk should be related to the recommendations that income tax return preparers make to their clients if it actually represents a combination of their potential losses and the probability that those losses will occur. The subjects were asked about the position on this tax issue that they would suggest to their clients. The question was stated as "Do you recommend taking the deduction on this (these) client's (clients') income tax return(s)?" Their Yes/No answer to the question was the dependent variable in a logistic regression test of all three hypotheses. The results of the statistical analysis are presented in table 11. Basically, these results are the same as those from the ANOVA test. The main effects for probability and consequence were significant (p-values 0.0416 and less than 0.0001 respectively (see table 11)). The only interaction pertinent to this study, probability by consequence, with a p-value of 0.9736 was not significant.

Results of the logistic test, using the income tax return preparers' recommendations as the dependent variable, augments those from ANOVA using perceived risk as the dependent variable.
TABLE 11

Test of Income Tax Preparers' Perceived Risk for Making Aggressive Recommendations to Clients

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<td>Weight Variable: None</td>
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<tr>
<td>Data Set: LOGRISK</td>
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<tr>
<td>Frequency Missing: 6</td>
</tr>
<tr>
<td>Response Levels (R) = 2</td>
</tr>
<tr>
<td>Populations (S) = 8</td>
</tr>
<tr>
<td>Total Frequency (N) = 176</td>
</tr>
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<td>Observations (Obs) = 176</td>
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<table>
<thead>
<tr>
<th>ANALYSIS-OF-VARIANCE TABLE</th>
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<td>DEC_TYPE</td>
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<tr>
<td>PROB</td>
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<tr>
<td>DEC_TYPE*PROB</td>
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<tr>
<td>CONS</td>
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<tr>
<td>DEC_TYPE*CONS</td>
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<table>
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<th>ANALYSIS OF WEIGHTED-LEAST-SQUARES ESTIMATES</th>
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<tr>
<td>INTERCEPT</td>
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<td>DEC_TYPE</td>
</tr>
<tr>
<td>PROB</td>
</tr>
<tr>
<td>DEC_TYPE*PROB</td>
</tr>
<tr>
<td>CONS</td>
</tr>
<tr>
<td>DEC_TYPE*CONS</td>
</tr>
<tr>
<td>PROB*CONS</td>
</tr>
<tr>
<td>DEC_TYPE<em>PROB</em>CONS</td>
</tr>
</tbody>
</table>
Summary

The first hypothesis was supported when the potential losses to the preparer were one-tenth of the single play amount but not when the amounts were the same. However the results were not in the predicted direction. There was no main effect for type of decision when the multi-play amount was the same as for single play. Income tax return preparers appear to combine the probability of the IRS' assessing penalties and damages in the same manner when assessing risk for a decision that applies to one client as when assessing risk for a decision that applies to several clients when the future losses related to each client are the same. Therefore, $H_{A1}$ was supported by data from the control group but not by the multi-play data.

There was no probability by consequence interaction for perceived risk. Nor was there a main effect for probability when only the multi-play data was analyzed, therefore the second hypothesis was not supported. Income tax return preparers do not appear to combine information according to an information integration theory multiplicative model when making decisions for several clients. Instead, the model that income tax return preparers use appears to depend upon the amount of their potential losses. A special case of the additive model in which they ignored probability was used.
for the multi-play decisions when consequence was the same as for single play. When the consequence was one-tenth of the single play amount, the preparers appeared to use a combination model to make decisions.

There is overwhelming statistical support for an additive model when making decisions applicable to only one client. There were main effects for probability and consequence but no interaction between the two. $H_{A3}$ was also supported by the graphs of the estimated cell means, which plotted as monotonically increasing parallel curves.

The results presented in this chapter will be reviewed in the next chapter. Then the contributions and limitations of the study will be addressed along with possibilities for future research.
CHAPTER 5
SUMMARY AND CONCLUSIONS

Introduction

Despite the tremendous amount of the tax gap, taxpayers pay more income taxes that most consider economically rational (Alm, McClelland and Schulze 1992). This study may help explain this overpayment by some taxpayers and underpayment by others by examining the perceived risk that tax preparers associate with reporting aggressively on their clients' tax returns. Approximately 50% of all income tax returns are prepared by paid preparers (Internal Revenue Service 1994). The risk these preparers perceive in reporting aggressively may influence the taxpayers' (their clients') compliance decisions.

This study investigated the effect that the probability of the IRS' examining a client's tax return and the consequence (damages) the preparer may suffer has on preparers' perceived risk of reporting aggressively on their clients' income tax returns as well as the cognitive algebra that tax preparers use to formulate risk perceptions.

This chapter is organized in four subsections. The first subsection summarizes and interprets the results
of the study. In the second subsection, the research contributions of the study are addressed. Limitations of the study are enumerated in the third subsection. The fourth and last subsection presents future research opportunities.

Summary and Discussion of Results

Most of the 244 subjects were sole practitioners or partners in small CPA firms. Their assumption of the risks of self-employment sets them apart from the general population. The mean scores on the JPI-R were 56 and 75.6 for risk and traditional values, respectively. These mean scores show that the income tax return preparers in this study follow the rules and adhere to traditional values but are risk seeking in financial matters. A high score for risk means that the subjects “are prone to exposing themselves to situations having uncertain outcomes” (Jackson 1994, 23). The subjects’ constant exposure to uncertain outcomes may moderate the risk they perceive for decisions they make on a daily basis, e.g., whether to assume an aggressive posture on a particular tax issue.

Although many researchers have found that a person’s ethical and financial risk propensities affect their income tax reporting decisions, the subjects in this study may not have been influenced by their personal risk propensities because they were not making decisions solely for themselves. Instead, they were making decisions for
their clients. Several subjects commented that they took more risk on their personal income tax returns than on their clients' income tax returns. Therefore, their personal risk propensities may be moderated when they function as professional income tax advisers.

The lack of support for the first hypothesis using the same amount for each multi-play decision as for a single play decision may be attributed to the magnitude of the manipulation being insufficient to produce a significant difference in decision type. If, in their role of client advocate, income tax return preparers consistently take aggressive positions on most of their clients' income tax returns, they may feel that the decision to take an aggressive position on only ten tax returns does not materially increase the possibility of a large future loss. The empirical data fails to reject the first null hypothesis which was income tax return preparers will perceive the same risk for reporting aggressively on one (single play decision) client's income tax return as for reporting aggressively on ten clients' (multi-play decision) income tax returns when the preparers' potential losses are identical.

There was a significant difference in the risk perceived by the control group and that perceived by the single play group. But, the difference was not in the expected direction for three of the four manipulations.
The control groups (fraction-of-multi-play groups) are merely two lower levels of multi-play consequence. According to the premises of information integration theory the same decision model should be used for the fraction-of-multi-play decisions as for the multi-play decisions. Instead, income tax return preparers used a decision model for fraction-of-multi-play amounts that is different from the additive model used in single play decisions and from the special case of the additive model used in multi-play decisions when consequence was the same amount as in the single play condition. This finding casts doubt on the findings of other studies that have used a reduced value of each gamble. Findings in those studies may be due to an inherent difference in the gambles rather than to a difference in the decision models utilized by the decision makers.

The second and third hypotheses which predict that a multiplicative model is used for repeated decisions and an additive model for unique decisions were tested after finding that the control groups differed significantly from the single play groups. There was no significant difference in income tax preparers' perceived risk for single play and multi-play decisions when consequence was the same dollar amount. The preparers used an additive model to formulate their perceived risk of reporting aggressively on their clients' income tax
returns when consequence was the same amount regardless of
the number of clients affected by the decision. When
multi-play consequence was one-tenth of the single play
amount, the preparers used a combination model to
formulate their perceived risk. Consequence is highly
significant in the determination of perceived risk.
Probability is ignored in multi-play decisions when
consequence is the same as for the single play groups.
This is consistent with the finding of Diamond (1988) in
that probability is ignored when consequences are high.
It also agrees with findings of Payne and Braunstein
(1971) that the most influential factor in situations
where the probability of winning is greater than the
probability of losing is the value of the outcome
(consequence).

To summarize: the results failed to support the
first research hypothesis—income tax return preparers
perceive less risk for a single play decision than for a
multi-play decision when the consequence to the preparer
are the same; or the second hypothesis—income tax return
preparers will use a multiplicative model to make multi-
play decisions. The third hypothesis was supported—income
tax return preparers will use an additive model to make
single play decisions.
Research Contributions

The results of this study will be useful to researchers as well as to taxing authorities. Researchers will benefit from knowing that income tax return preparers used the same model for forming risk perceptions for one client as for several clients when the consequence to the preparer were the same for each client. Also, the study shows that tax preparers did not use the same model when consequence was small (one-tenth) as when it was large. This suggests that the findings of studies re decisions making under uncertainty that employed a fraction of a gamble to be played multiple times as the long-run (multi-play) manipulation of the decision type construct may not be valid because of intrinsic differences in the way people make decisions for small and large consequences.

In nonacademic settings, knowing that income tax preparers’ perceived risk is approximately the same for reporting aggressively on one client’s return as for reporting aggressively on several returns may help taxing authorities in selecting returns to examine and in selecting variables to manipulate to increase compliance. The study supports the IRS’s decision to attempt achieving greater compliance without increasing the number of tax returns examined. While preparers appeared to be adding probability of penalties being assessed to consequences, perceived risk increases very slowly. Therefore,
doubling the number of returns examined will probably increase preparers' perceived risk (or reduce their aggressive reporting postures) only a minuscule amount. The IRS should consider revising preparer penalties from the current fixed amounts of $250 and $1,000 to a percentage of additional taxes assessed to the preparers' clients, since consequence has a significant effect on preparers' perceived risk. Also, the IRS should select returns for examination without regard to the preparer's age, gender, or size of firm since these characteristics do not appear to influence the aggressiveness of their recommendations to clients.

This study also helps explain why actual tax filings are so conservative and deviate from expected utility theory predictions while the "tax gap" continues. The finding that preparers are financial risk takers helps explain their exploiter role. On the other hand, their high score on traditional values may lead them, in their enforcer role, to insure that their clients pay close to their "fair share" of income taxes.

**Limitations**

The subjects for this study are employees of CPA or law firms; therefore, the results of the study cannot be generalized to all income tax return preparers. Since the test scenario involves only one deduction—medical expenses for periods extending beyond one year—the results
may not be generalizable to other situations. It is not possible to include all the pertinent information tax professionals may have in real practice in a laboratory test environment; thus, tax professionals may make different decisions in practice. The results may be biased if the nonmonetary consequences of the IRS' assessing penalties are not constant across conditions. This study deals with only two types of risk—financial and ethical. Income tax return preparers may face other types of risk (e.g., social, psychological, physical, and time) which may influence their decisions and bias the results of this study.

**Research Opportunities**

There are many opportunities for further tax related research in this area. Future research may address the factors that dominate particular tax decisions. Nonmultiplicative models may be investigated further to identify the precise model (adding, subtracting, dividing, or a combination of these arithmetic operations) income tax return preparers use to make certain tax decisions. The author is researching the compromise point between maximizing expected value and achieving an individually determined level of acceptable risk.
REFERENCES


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## APPENDIX A

**NUMBER OF SUBJECTS BY GROUP**

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of Subjects</th>
<th>Total ANOVA</th>
<th>ANCOVA</th>
</tr>
</thead>
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<tr>
<td><strong>Multi-Play Decision Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Probability/High Consequence</td>
<td>23</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>High Probability/Low Consequence</td>
<td>23</td>
<td>22</td>
<td>15</td>
</tr>
<tr>
<td>Low Probability/High Consequence</td>
<td>26</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Low probability/Low Consequence</td>
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<td>22</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td><strong>95</strong></td>
<td><strong>89</strong></td>
<td><strong>74</strong></td>
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<tr>
<td><strong>Single Play Decision Group</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High Probability/High Consequence</td>
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<td>21</td>
<td>20</td>
</tr>
<tr>
<td>High Probability/Low Consequence</td>
<td>20</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Low Probability/High Consequence</td>
<td>28</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Low probability/Low Consequence</td>
<td>18</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td><strong>87</strong></td>
<td><strong>81</strong></td>
<td><strong>70</strong></td>
</tr>
<tr>
<td><strong>Control Group (Fraction of Multi-Play Decision Group)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Probability/High Consequence</td>
<td>16</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>High Probability/Low Consequence</td>
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<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Low Probability/High Consequence</td>
<td>14</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Low probability/Low Consequence</td>
<td>15</td>
<td>12</td>
<td>12</td>
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<tr>
<td></td>
<td><strong>62</strong></td>
<td><strong>54</strong></td>
<td><strong>54</strong></td>
</tr>
<tr>
<td><strong>Total Number Subjects in Sample</strong></td>
<td><strong>244</strong></td>
<td><strong>224</strong></td>
<td><strong>198</strong></td>
</tr>
</tbody>
</table>
APPENDIX B

EXCERPTS FROM THE EXPERIMENTAL TASK

100
Dear Professional Income Tax Preparer:

Please participate in this study. As a practicing income tax professional, you are sometimes required to interpret and apply the law when there is ambiguous or conflicting authority. The purpose of this study is to learn more about how professionals such as you make decisions in situations with ambiguous tax consequences. While you may consider numerous factors when making these decisions, I am specifically interested in how professionals form risk perceptions and how those perceptions affect their decisions.

To examine this issue, you will be asked to make a reporting recommendation to a hypothetical client concerning an item with ambiguous tax consequences. In addition to recommending a tax position, you will also be asked to assess the risk the reporting situation adds to the engagement. This is not a test; there are no “right” answers to the case you will review. I am interested in your opinions and assessment of the case. Your responses are anonymous and will only be used in presenting aggregate results.

After reviewing the case, you will be asked some additional questions. Again, these are intended to give me an idea of who is participating in the study and responses will be kept strictly confidential. Please answer all of the questions as well as you can.

Thanks again for your time. The specific instructions begin on the next page. The study should take no more than 15 minutes to complete. Please allow enough time to complete it without interruption. Section I should be returned to me in the enclosed envelope. Section II is provided for your convenience. This study is part of my Ph.D. dissertation at Louisiana State University. I appreciate your help.

Sincerely,

V. Carlene Eddlemon
A RESEARCH STUDY CONCERNING INCOME TAX PREPARERS' DECISION MAKING.

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Part II - True/False Questions...................3
Demographics........................................4

Please Return this Section by November 15, 1995 in the Enclosed Postage Paid Envelope to:

Ms. Carlene Eddlemon
Department of Accounting & Business Law
University of Texas - Pan American
1201 W. University Drive
Edinburg, Texas 78539
INTRODUCTION

This research study investigates how income tax return preparers form risk perceptions when making tax related decisions. While there is general consensus about the nature of perceived risk, there is no universally accepted definition of perceived risk. Webster’s Dictionary defines risk as "the possibility of loss, disadvantage or damage; it is the subjective estimation of loss as measured by the decision maker."

Your task is (1) to record the amount of risk that you perceive in the following tax situation, and (2) to indicate the tax position you recommend.

Assume that the taxpayers have reported honestly and accurately on all previously filed tax returns and that they want items in gray areas reported on their tax returns in the manner that is most favorable to them. Assume further, that they understand that if certain positions are taken on items in gray areas that they (the taxpayers) may have to pay additional taxes and interest if the IRS audits those items.

Read the tax case carefully. At the bottom of the case there is a hundred point continuous scale. The two end points of the scale have been marked as 0, Very Low Risk, and 100, Very High Risk. Record the risk you perceive for yourself and your firm for the case by placing a slash (/) on the scale line below it.

<table>
<thead>
<tr>
<th>Very Low Risk</th>
<th>Very High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>! . . . . , ! / . . . . , . . . ! . . . . , . . . !</td>
<td>0 / 100</td>
</tr>
</tbody>
</table>

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PART I

At least 10 of your clients, all in their early 50's, have been offered early retirement packages. None of their employers provide medical benefits to retired employees. However each employer has a voluntary employees benefit association, as defined by IRC §501(c)(9). Retired employees may participate in an association's health care program by paying a lump-sum amount (approximately $54,000 which will average $250 - $300 per month until each retiree and his/her spouse are 65 years old and eligible for Medicare).

The plans cover all medical expenses—drugs, dental, vision care, contact lens, etc.—for both the retired employee and his/her spouse until they are 65 years old and eligible for Medicare. These clients' retirement packages include sufficient cash to prepay the medical expenses. Each of these clients has already incurred medical expenses for this tax year that will not be reimbursed by medical insurance exceeding 7½% of their AGI. If your clients pay the entire amount now and claim it as a medical deduction on their income tax returns, each of their income taxes will be reduced by approximately $16,700.

Each of these clients files a joint tax return with his/her spouse. Except for the early retirement offer, their returns for this year are very similar to each other and to their prior years' returns. Items on a typical return are:

<table>
<thead>
<tr>
<th>Last Year</th>
<th>This Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>$105,000</td>
</tr>
<tr>
<td>Interest and Dividends</td>
<td>4,500</td>
</tr>
<tr>
<td>Schedule E income</td>
<td>1,725</td>
</tr>
<tr>
<td>Capital Gains (Losses)</td>
<td>(1,500)</td>
</tr>
</tbody>
</table>

*Includes early retirement payment.

They have the usual itemized deductions for home interest ($2,500), real estate taxes ($3,000), and contributions ($3,000) for both years and, for this year, medical expenses exceeding 7½% of AGI plus the $54,000.

You must decide whether to deduct the $54,000 payment for medical care (IRC §213). Their employers cannot provide income tax guidance to them because this is an area the IRS is studying and for which the IRS will not issue private letter...
rulings (Rev. Proc. 95-3). However, the IRS District Director for your area was recently quoted as saying, "We (the IRS in your district) will actively pursue overly aggressive deductions for medical care extending beyond one year even though the National Office is not making advance rulings on this issue."

You must make a recommendation to your clients but the authorities relating to such payments are ambiguous. The relevant authorities are summarized on pages 5 and 6. If the medical deduction is disallowed, each client will be assessed the excess tax, interest on the excess tax, and penalties totalling $5,000. If you recommend a tax position to a client, your firm pays the penalty for the client in the event the IRS disallows the deduction. Please indicate the amount of risk you perceive for yourself and your firm in taking this deduction on all these clients' tax returns.

Very Low             Very High
Risk               Risk

0                        100

Do you recommend taking the deduction on all these clients' tax returns?

Yes ____  No ____
Please provide the following demographic information.

1. Age: _____
2. Gender: Female ____ Male ____
3. Primary area of accounting: Tax ____ Audit ____ Other ____
4. Years experience in tax preparation: _____
5. Highest level of education: Less than Baccalaureate Degree (please specify) ____
   Baccalaureate Degree in Accounting ____ other (please specify) _____________
   Master's Degree ___ in Accounting ___ Taxation ___ Other ___
   Law Degree ___ PhD ___ Other Advanced Degrees (specify) _____________
6. Number professional personnel, including partners, in your accounting firm _____
7. Household Income: ____________________
8. How believable was the issue?
   Very Unbelievable Very Believable
   ! ! ! ! ! ! ! ! ! ! ! ! 0 1 2 3 4 5 6
9. What factor(s) did you consider in assessing risk? ____________________________
10. Is the amount of risk you perceive for yourself different from that you perceive for your firm?
   (Explain) _____________________________________________________________
11. Mark the scale below to answer: “Do you think the scenario is clear cut?”
   Very Clear Cut
   Only One Possible
   No Correct
   Correct Answer
   Answer
   ! ! ! ! ! ! ! ! ! ! ! ! 0 1 2 3 4 5 6
12. Describe any situations that you have encounter in practice concerning prepaid medical expenses. _____________________________________________________________
13. How many of your clients have had similar tax problems? ________________
14. Without looking back at the case, how many clients were you making a decision for in this study? ____________

Thanks for completing this questionnaire!

* Carleen Eddlemon
A RESEARCH STUDY CONCERNING
INCOME TAX PREPARERS’ DECISION MAKING.

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SUMMARY OF AUTHORITIES CONCERNING AMBIGUOUS MEDICAL PAYMENTS

Internal Revenue Code (IRC) Sec. 213(a) which covers the deductibility of medical, dental, etc., expenses states:

There shall be allowed as a deduction the expenses paid during the taxable year, not compensated for by insurance or otherwise, for medical care of the taxpayer, his spouse, or dependent (as defined in section 152), to the extent that such expenses exceed 7.5 percent of adjusted gross income.

The related Income Tax Regulations (Regs) §1.213-1 state:

(a) Allowance of deduction: (1) Section 213 permits a deduction of payments for certain medical expenses (including expenses for medicine and drugs). Except as provided in paragraph (d) of this section (relating to special rule for decedents) a deduction is allowable only to individuals and only with respect to medical expenses actually paid during the taxable year, regardless of when the incident or event which occasioned the expenses occurred and regardless of the method of accounting employed by the taxpayer in making his income tax return. Thus, if the medical expenses are incurred but not paid during the taxable year, no deduction for such expenses shall be allowed for such year.

Neither the IRC nor the Regs require that medical payments apply to services already rendered or obligations previously incurred. Both require only that payment be made in the year the deduction is taken. However, the IRS relies on the 1956 Bassett case (26 TC 619) to disallow deductions for prepaid medical expenses except as noted below. The Bassetts' medical expenses were less than the annual percentage-of-adjusted gross-income (3% in 1950) in both 1950 (the year of prepayment) and 1951 (the year the
expenses were incurred). The Tax Court considered the intent of the law in deciding the Bassett case saying that to allow their prepaid medical expenses would violate the purpose of its enactment and yield a result contrary to the Congressional intent. In computing the medical expenses for a taxable year, to include a prepaid item for medical services not rendered in the year of payment might qualify a taxpayer for a medical deduction, whereas if an advance payment for medical care is not given recognition the total medical expense may not be in excess of the 5% per cent limitation in the taxable year or ensuing years.

Congress has amended the IRC numerous times since 1956, yet the requirement that medical payments apply only to the current year or preceding years has not been added to §213.

One exception applies to the prepayment of medical care to be provided after the taxpayer becomes 65 years old (IRC § 213(d)(7)).

Subject to the limitations of paragraph (6), premiums paid during the taxable year by a taxpayer before he attains the age of 65 for insurance covering medical care (within the meaning of subparagraphs (A) and (B) of paragraph (1)) for the taxpayer, his spouse, or a dependent after the taxpayer attains the age of 65 shall be treated as expenses paid during the taxable year for insurance which constitutes medical care if premiums for such insurance are payable (on a level payment basis) under the contract for a period of 10 years or more or until the year in which the taxpayer attains the age of 65 (but in no case for a period of less than 5 years).

Another exception applies to the portion of the entrance fee to a life-care facility allocable to the
taxpayer’s medical care, where the obligation to pay the facility is incurred when payment is made, even though medical services will only be rendered in the future, if at all (Rev Rul 75-302, 1975 CB 86). This exception has no age requirement and is a lump sum payment.

Regulation §1.213(e)(1)(iii) allows a taxpayer to deduct the difference in the excess of the cost of capital improvements and the increase in the value of the property as a medical expense if it has as its primary purpose the medical care of the taxpayer, his spouse, or his dependent. The Regs use the example of an elevator that costs $1,000 and increases the value of the property $700. The $300 difference is not deducted ratably over the life of the improvement but deducted in full in the year acquired as a medical expense.

Thus, the IRS is inconsistent in allowing prepaid medical amounts. In this case, the taxpayers (your clients) must make a lump-sum payment to participate in a voluntary employees benefit association as defined by IRC § 501(c)(9) which will provide medical care until the taxpayer and his/her spouse are eligible for Medicare. Does this prepayment fall under the general rule of being deductible when paid, the Bassett case which disallows prepaid medical expenses, or the life-care exception where
the obligation to pay is incurred when payment is made and which is currently deductible?
VITA

Velmer Carlene Eddlemon, Certified Public Accountant (CPA), was born in Vernon Parish, Louisiana in 1943. She attended Northwestern State University in Natchitoches, Louisiana, where she received a bachelor of science degree in accounting in 1967. She left Northwestern for a year, prior to graduating, to become the first female to participate in the U.S. Department of Defense (DOD) management trainee program. After a year in the DOD program, she returned to Northwestern to complete her undergraduate studies. After graduation from Northwestern, she owned and operated an H&R Block franchise in Leesville, Louisiana. She received her CPA certification from Louisiana in 1968 and Texas in 1970. Her 20 years in public accounting were spent with L. A. Champagne & Co., Baton Rouge, Louisiana; Arthur Andersen & Co., Ft. Worth, Texas; and Eddlemon Brister & Co., Dallas, Texas.

In 1988, she retired from public accounting to enter the doctoral program at Louisiana State University in 1989. Again, prior to completing the program she left LSU and taught at Wayne State University in Detroit, Michigan; The University of Texas - Pan American in Edinburg, Texas;
and Eastern Kentucky University in Richmond, Kentucky. She received a doctor of philosophy degree in accounting with a concentration in taxation and a minor in economics in 1996.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Velmer Carlene Eddlemon

Major Field: Accounting

Title of Dissertation: An Information Integration Theory Analysis of Tax Preparers’ Perceived Risk of Reporting Aggressively on Clients’ Income Tax Returns

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

August 20, 1996