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Effects of Dispositional Motivation on Knowledge and Performance in Tax Issue Identification and Research

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ABSTRACT: Previous accounting research on how motivation affects judgment/decision making performance has examined the influence of temporal incentives such as monetary rewards and accountability. We extend this line of research by examining dispositional motivation—the stable individual trait of achievement striving. We first examine whether dispositional motivation affects the extent to which beginning tax professionals acquire tax knowledge over the course of their academic pursuits and first year of professional practice. This aspect of knowledge acquisition has not previously been examined in accounting research. We expect that knowledge differences, in turn, will predict performance in tax issue identification and in tax research. In addition, we hypothesize dispositional motivation will have a *direct* effect on tax research performance, but not on issue identification. Finally, we hypothesize dispositional motivation will be *mediated* by task-relevant knowledge in tax research. With one exception, all the hypotheses are met. We conclude by discussing further avenues for research on the role of dispositional motivation in accounting settings.

Keywords: motivation; issue identification; information search; decision making.

JEL Classifications: D80; D83; D89; M41; H29.

INTRODUCTION

Accounting is concerned with providing economic information useful for decision making (ASOBAT 1966). Decision making, in turn, is a function of task and decision maker characteristics (Libby and Tan 1994). Relevant decision maker traits include an individual's knowledge, ability, and motivation (Einhorn and Hogarth 1981). Previous research on motivation and decision performance in accounting has focused on temporal, *situational* influences on performance, such as financial incentives and accountability (e.g., Ashton 1990; Awasthi and Pratt 1990; Libby and Lipe 1992; Kennedy 1993, 1995; Bailey et al. 1998; Sprinkle 2000; Gibbs et al. 2004). Situational motivation reflects external motivators specifically designed to improve performance in a particular setting (e.g., Goldberg 1990; McCrae and Costa 1997; Paunonen and Ashton

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2001). In contrast, the effects of individuals' internal, *dispositional* motivation, i.e., motivation as a stable personality trait or tendency such as those toward conscientiousness, persistence, or achievement (Jenkins et al. 1971; Barrick and Mount 1991), have not been examined in accounting settings (Ashton 1999).

Providing situational incentives has generally been successful in producing enhanced performance in experimental accounting studies (e.g., Libby and Lipe 1992). However, it is well known that individuals can vary to a large extent in their innate, dispositional motivations (Jenkins et al. 1971). Dispositional motivation remains an unexplored theoretical source of individual decision maker differences in accounting decision performance, a source that could be important for understanding how users of accounting information recognize and process that information.

The purpose of this paper is to extend the inquiry of the effects of motivation on accounting decision performance by investigating the motivation induced by dispositional influences, specifically, achievement striving (hereafter, achievement) (Jenkins et al. 1971). Achievement measures the extent to which an individual is hardworking, determined, persistent, persevering, and self-disciplined (Barrick and Mount 1991). Achievement has predicted performance across a diverse array of people, tasks, and performance criteria (e.g., Jenkins et al. 1971; Helmreich et al. 1988; Barling et al. 1996). However, the usefulness of dispositional motivation such as achievement to explain judgment/decision making performance in isolated decision tasks (i.e., one-shot settings) has been examined in only a few studies, and not at all in accounting or tax settings. Thus, this study is the first in the accounting literature to examine the performance effects of achievement on judgment/decision making, and the first study to examine achievement effects on issue identification and information search in any decision setting.

We examine the effects of dispositional motivation on the acquisition of tax knowledge for two areas of judgment performance that pervade accounting decision settings: tax issue identification and tax research. Relying on prior findings that increases in motivation might or might not result in improved performance, depending on characteristics of the decision maker and task (Lepine et al. 2000), we propose that (1) greater achievement results in greater acquisition of tax knowledge, (2) greater knowledge leads to superior performance in both tax issue identification and tax research performance, (3) greater achievement also has a direct effect on improving tax research (but not tax issue identification) performance, and (4) the effects of achievement on tax research performance are mediated by tax knowledge.

Tax issue identification and research are two key tasks that condition the information evaluation, judgment formation, and choices that follow, and that ultimately affect the outputs of compliance and planning activities (Roberts 1998). These two tasks were selected because they appear to be differentially sensitive to motivational influences and, as such, provide contrasting settings in which to examine the potential effects of dispositional motivation on performance. Tax issue identification (when no external research is permitted) should be highly sensitive to an individual's internal memory of tax technical knowledge. In contrast, external information search should be sensitive to an individual's internal memory of tax technical knowledge *plus* the amount of effort expended in searching and scanning tax law databases.

This paper contributes to the accounting literature in the following ways. First, this is the first paper to examine the effects of the stable personality trait of achievement on knowledge acquisition and on judgment/decision making performance. Second, we find that achievement positively predicts the amount of tax knowledge possessed by beginning tax professionals—relevant tax knowledge they are able to apply to representative tax tasks. Third, we find that achievement has differential effects on performance depending on the task: achievement directly and positively affects tax research performance, but not issue identification. Fourth, we demonstrate the effects of achievement on tax research performance are mediated by knowledge.

The remainder of the paper proceeds as follows. The second section discusses performance as a function of knowledge, ability, and motivation. We briefly summarize what is known about the effects of (situational) motivation on performance in accounting. We present evidence linking achievement to performance in nonaccounting settings, and suggest how the performance effects of situational motivators are likely to compare to dispositional motivators. We also present hypotheses for this study. The third section describes the two tasks, the participants, and the measures of knowledge, motivation, and performance used to test the hypotheses. The results are presented in the fourth section, and some conclusions and suggestions for further research are offered in the fifth section.

THEORY AND HYPOTHESES DEVELOPMENT

What Drives Performance?

The question "What drives performance?" lies at the heart of most accounting research, whether it is conducted at the individual or firm level, whether it relies on archival, experimental, or theoretical research methods, and whether its aim is to describe, evaluate, or improve the phenomena of interest. One answer to the question is that performance is determined by ability, knowledge, motivation, and environment (Einhorn and Hogarth 1981), where the fourth determinant, environment, is construed broadly to include all performance drivers not captured by the first three. Much of the accounting research on judgment and decision making has taken this perspective (see, e.g., Libby and Luft 1993).

At a less abstract level, and holding "environmental" variables constant, the proposition that performance is a multiplicative function of ability and motivation, or $P = f(A \times M)$, is one of the oldest tenets of individual and organizational psychology (Maier 1955; Heider 1958) and is supported by considerable research (e.g., O'Reilly and Chatman 1994; Wright et al. 1995). Ability refers to an individual's capacity to perform particular tasks, while motivation refers to the willingness to initiate and sustain effort on task-related activities. The multiplicative form of the relation captures the notions that both ability and motivation are necessary for performance, neither alone is sufficient, and a sufficiently low level of ability (motivation) will seriously impair performance regardless of how motivated (able) one is. Of course, performance is not completely determined by ability and motivation, but the $P = f(A \times M)$ formulation is a succinct and intuitive way to represent relationships that apply in many different settings.

The role of *ability* as a determinant of performance in accounting settings is well-established, especially in terms of its influence on the task-related *knowledge* required for performance (e.g., Bonner and Pennington 1991; Libby 1995). Libby (1995) reviews accounting research on the performance implications of ability and knowledge, along with experience, using the "antecedents-and-consequences-of-knowledge" model. This model posits that performance is jointly determined by ability and knowledge, while knowledge itself is jointly determined by ability and experience. Stated differently, greater ability and greater experience result in greater knowledge, and greater knowledge, along with the direct effect of ability, results in better performance. Thus, the model posits that performance in accounting settings entails four causal relations: (1) experience→knowledge, (2) ability→knowledge, (3) knowledge→performance, and (4) ability→performance. The model's four variables and the suggested relations among them had earlier formed the basis of the "job performance" model in the organizational psychology literature (e.g., Hunter 1983, 1986; Hunter and Hunter 1984; Schmidt and Hunter 1992; Schmidt et al. 1986, 1988, 1992), and many studies have supported the posited relations.

Note, however, that *motivation* is missing. Of course, motivation might be viewed as one of the many "environmental" variables that often are assumed to be constant across individuals. However, motivation's position as a critical determinant of performance demands that it be explicitly included in a more complete model of performance. Because motivation, like ability, has

the potential to affect performance both directly and indirectly (through its effect on knowledge), two additional causal relations emerge: (1) motivation→knowledge, and (2) motivation→performance. The resulting model of performance determinants is shown in Figure 1.

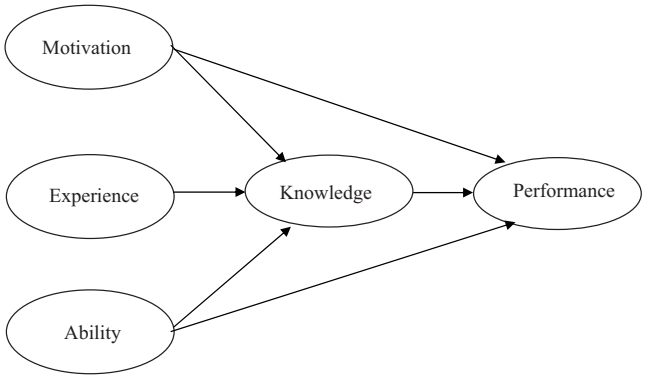
Situational and Dispositional Sources of Motivation

Recent comprehensive reviews of the enormous literature on the performance effects of financial incentives in laboratory tasks (Jenkins et al. 1998; Camerer and Hogarth 1999; Bonner et al. 2000; Bonner and Sprinkle 2002; Hertwig and Ortmann 2001) have produced three major conclusions concerning the relation between financial incentives and performance that are relevant to the present study. First, financial incentives can have *positive* effects, *no* effects, or *negative* effects on performance. Second, varying the *amount* of the financial incentive is often found to have little or no effect on performance (Camerer and Hogarth 1999). Third, the literature establishes that a number of individual and organizational variables may interact with incentives in determining performance. These include the performance target or goal, the complexity of the task, the individual's self-efficacy (belief concerning the likelihood he or she will be able to attain a specific level of performance), the particular dimension(s) of performance rewarded, feedback about past performance, and the type of incentive scheme employed (e.g., fixed pay, piece rate, quota).

Thus, the extent of the effect of financial incentives—and even its direction—depends on several characteristics of the person, task, and setting. The same can be said of accountability, another key situational motivator (Lerner and Tetlock 1999). Situational motivators such as financial incentives and accountability leave a lot of performance variance unexplained, calling attention to other performance determinants such as ability, experience, and knowledge (as in Figure 1), as well as to *dispositional* motivators such as achievement.

Dispositional motivation is typically assessed by personality tests that require individuals to indicate the degree to which they believe they are accurately described by a series of short phrases or statements. In the past, personality tests had a mixed reception in psychology, stemming largely from the "situation versus disposition" debate in which both the nature of dispositions (personality traits, needs, preferences, attitudes) and their usefulness for predicting behavior were strongly questioned. Guion and Gottier (1965) and Mischel (1968) maintained that only weak evidence

FIGURE 1
General Determinants of Performance



existed for both the consistency of personality across situations and the validity of personality tests, and that personality measures explained only a trivial amount of variance in behavior.

These and similar claims prompted an enormous amount of research "which ultimately resulted in a *reversal* of the critics' conclusions" (Hogan and Ones 1997, 850; emphasis added). Today there is considerable agreement concerning the stability, validity, and usefulness of (certain) personality measures. More generally, it is well-accepted that behavior is significantly determined by both situational and dispositional factors (see, e.g., Schneider 1983; Epstein and O'Brien 1985; House et al. 1996). The stability of dispositions and their relevance to behavior is further supported by research indicating that dispositions are the result of both social-learning processes (e.g., McClelland 1985; McClelland and Pilon 1983) and genetic factors (e.g., Tellegen et al. 1988; Bouchard et al. 1990; Bouchard 1993).

While the 1960s to the mid-1980s were the "dark age for personality" (Hough and Ones 2002, 233), the situation changed dramatically 15 to 20 years ago with the introduction of the five-factor model of personality (the "Big 5"). This model maintains that people can be described along the five dimensions of conscientiousness, agreeableness, extraversion, openness to experience, and emotional stability.[1]

The Big 5 dimension of conscientiousness has emerged as an especially powerful predictor of long-run job performance.[2] Conscientiousness is a measure of dispositional motivation that captures both the "will to achieve" and the "discipline and energy level that can sustain the hard work necessary for performance" (O'Reilly and Chatman 1994, 609). The role of conscientiousness as an enduring characteristic of individuals is reflected in the fact that it has a substantial genetic component (Bergeman et al. 1993; Bouchard 1993; Jang et al. 1996, 1998; Loehlin et al. 1998) and is stable throughout adulthood (Costa and McCrae 1988, 1997; McCrae and Costa 1990; Judge et al. 1999; Srivastava et al. 2003).

It would be unreasonable to expect that dispositional motivation is *always* positively related to performance. For example, in tasks that require prompt completion, the deliberation and thoroughness associated with conscientiousness could be detrimental to performance (Tett 1998). In addition, a positive relation between conscientiousness and performance could disappear after a significant change in the structure or requirements of the task—at least until the person had gained experience with, or received information about, the new task structure or requirements. In fact, Lepine et al. (2000) found a *negative* relation between conscientiousness and performance in a multiple-cue probability learning task after an abrupt change (which was not disclosed to participants) in the rules relating the nine cues to the correct decision. Lepine et al. (2000, 583) conjectured that, once the participants had developed some understanding of the rules linking the cues to the criterion *before* the change occurred, they may have "persevere[d] too long in a course of action that was once fairly successful…before the new situation was completely understood."

The Lepine et al. (2000) study is particularly interesting because of the *post hoc* analysis of the negative association between conscientiousness and performance. Earlier researchers had observed that two distinct facets of conscientiousness seemed to exist—achievement and methodicalness (e.g., Barrick and Mount 1991; Costa 1996; Judge et al. 1997, 2002; McCrae and Costa 1997; Paunonen and Ashton 2001). *Achievement* is reflected in terms such as hardworking, determined, persistent, persevering, and self-disciplined. *Methodicalness* is reflected in terms such as organized, planful, deliberate, thorough, and dependable. When the negative effect of conscien-

[1] The development and continuing refinement of the Big 5 are described by Costa (1996); Costa and McCrae (1992); Goldberg (1990); John (1990); John et al. (1994); McCrae and Costa (1997); Mount and Barrick (1995); Paunonen and Ashton (2001); and Piedmont (1998).

[2] See, for example, the meta-analyses of Barrick and Mount (1991); Barrick et al. (2001); Judge and Ilies (2002); Judge et al. (2002), and Tett et al. (1991, 1999).

tiousness was disaggregated into the separate effects due to achievement and methodicalness (which Lepine et al. [2000] called "achievement striving" and dependability), it was found that the negative effect was driven entirely by methodicalness (dependability). In fact, the achievement facet was *positively* associated with performance after the change, just as it had been prior to the change.

Parallel with the methodological development of the conscientiousness dimension of the Big 5, a personality trait that is similar to the narrower *achievement* facet of conscientiousness has also been investigated. The original work in this area was primarily concerned with the "Type A" behavior pattern (Jenkins et al. 1971, 1974) and contended that Type A behavior consists of both a positive and a negative component—referred to as "achievement striving" and "impatience-irritability," respectively. Achievement, which reflects the extent to which individuals "take their work seriously, are active, and work hard" (Bluen et al. 1990, 212), overlaps considerably with the achievement facet of conscientiousness. Achievement has been found to be positively associated with performance in various types of tasks (e.g., Barling and Charbonneau 1992; Barling et al. 1996; Bluen et al. 1990; Helmreich et al. 1986, 1988; Spence et al. 1987, 1989).

Thus, while the evidence that the conscientiousness dimension of the Big 5 is positively associated with performance across a wide array of tasks, people, and performance measures is overwhelming, this does not *always* hold. And when a positive relation is not found, a more focused approach that examines achievement often finds a positive relation with performance. Therefore, as explained below in the "Method" section, we focus our investigation of dispositional motivation on the effects of achievement in the present study.

Knowledge and Performance in Issue identification and Information Search

Our choice of tasks was guided by Roberts' (1998) model of tax accountants' judgment/decision making, which involves five major classes of variables: (1) *individual psychological factors* such as ability and knowledge; (2) *economic environmental factors* such as the probability and magnitude of tax savings and IRS sanctions; (3) *task inputs* such as the complexity and ambiguity of case facts and applicable tax law; (4) *tax accountants' cognitive processing* (see below); and (5) *outputs or work products* such as tax returns, compliance memos, and planning advice.

The two key classes of variables for the purpose of the present study are class one, tax accountants' individual psychological factors (i.e., their dispositional motivation as measured by achievement), and class four, their cognitive processing. The latter class includes five subclasses of cognitive activities that are relevant to decision making in all domains—issue identification, information search (both "internal" from memory and "external" from various sources), information evaluation (analysis, synthesis, integration), formulation of an overall judgment, and making and implementing the resulting choice from among the available alternatives. Our tasks relate to the first two subclasses—issue identification and external information search—because the results of these "early" activities condition the information evaluation, judgments, and choices that follow, and because their central importance to tax decision making has made them the subject of much earlier research (e.g., Bonner et al. 1992; Spilker 1995; Cloyd 1995, 1997; Spilker and Prawitt 1997; Cloyd and Spilker 1999; Barrick 2001; Roberts and Ashton 2003; Magro 2005; Kadous et al. 2008).

Prior research on dispositional motivation has demonstrated it influences individuals' behavior over a long period of time. Thus, we expect higher-motivated first-year tax accountants will have acquired more tax knowledge over the course of their academic careers and during the first year of their professional careers than lower-motivated tax accountants. Therefore, our first hypothesis is:

H1: Tax accountants whose dispositional motivation is higher will have acquired greater amounts of tax knowledge.

Several prior studies have demonstrated the positive influence of knowledge on different aspects of tax decision making (Cloyd 1995, 1997; Spilker 1995; Roberts 1998; Barrick 2001; Roberts and Ashton 2003; Magro 2005). Likewise, we expect task-relevant tax knowledge will have a positive effect on performance in tax issue identification as well as tax research. Since the linkages between all three theoretical components—dispositional motivation, knowledge, and performance—are important aspects of this study, we also test the following hypotheses:

H2a: Task-relevant tax knowledge will be positively related to performance in tax issue identification.

H2b: Task-relevant tax knowledge will be positively related to performance in tax research.

Although we expect dispositional motivation to be positively related to tax knowledge (H1) for both of our experimental tasks (i.e., tax issue identification and tax research), we expect the effects of dispositional motivation on *performance* to depend on the nature of the task, i.e., on the mix of effort and knowledge that different types of tasks require (Lepine et al. 2000). In the issue identification task, as we explain later in the "Method" section, we are interested in the identification of tax issues that are relevant to a particular set of case facts. Recognition of relevant tax issues for the task we use should depend strongly on the participants' task-specific, technical tax knowledge. Therefore, performance is likely to be insensitive to dispositional motivation, that is, thinking harder will not produce technical knowledge one does not possess. We do expect, however, that *a priori* possession of the task-specific knowledge needed to successfully identify relevant tax issues will be a function of motivation, as indicated in H1. Therefore, we expect the influence of dispositional motivation on tax issue identification is *an indirect influence only*, i.e., for tax issue identification, Motivation→Knowledge and Knowledge→Performance, but Motivation does not affect Performance directly (see Figure 2).

In contrast to the determinants of tax issue identification, the tax research task may require formulating a strategy for searching an electronic tax database for tax authorities that are relevant to various fact situations (assuming one does not immediately identify the correct location based on prior knowledge), locating potentially relevant documents, and scanning and evaluating their applicability to the fact situations. Thus, tax research performance is likely to depend strongly on *both a priori* knowledge *and* motivation during the task as opposed solely to knowledge, and we expect individuals higher in achievement will have better performance (see Figure 3).

FIGURE 2
Effects of Dispositional Motivation on Knowledge and Performance in Tax Issue Identification

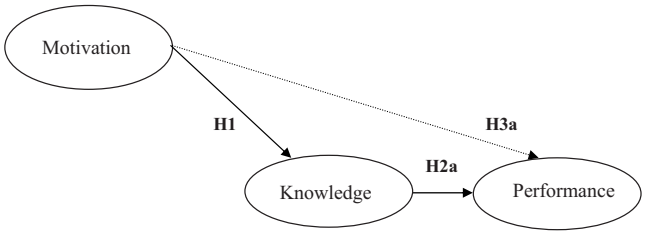
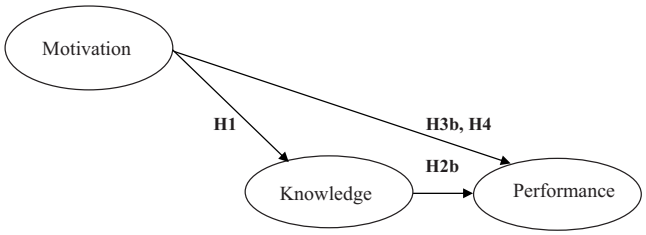


FIGURE 3
Effects of Dispositional Motivation on Knowledge and Performance in Tax Research



Both H3b and H4 test the effects of motivation on performance. H4 includes an additional prediction the effects of motivation will be mediated by knowledge.

H3a: Dispositional motivation will not affect tax issue identification.

H3b: Dispositional motivation will positively affect tax research performance.

Finally, we also expect that, while *both* dispositional motivation and knowledge will affect tax research performance, the effects of dispositional motivation will be *mediated* by participants' knowledge (Baron and Kenny 1986, 1173). As Baron and Kenny put it, mediation occurs when a third variable "represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest." So, in effect, we hypothesize that dispositional motivation affects tax research performance through the generative mechanism of tax knowledge. The theoretical reasons for our expectation are twofold. First, a widely found result of many studies of expertise differences indicates the primary distinguishing characteristic of experts is their greater task-relevant knowledge (Ericsson and Smith 1991). We expect that even among beginning tax professionals, none of whom are experts, participants with demonstrably greater amounts of task-relevant knowledge will have superior performance, *ceteris paribus*. Second, the nature of the tax research task involves knowing where to search as well as being able to navigate the electronic database quickly and efficiently. Between these two sets of knowledge/skills, we believe greater knowledge of where the research question is addressed in the Internal Revenue Code will have more bearing on search success than will achievement. Thus, our final hypothesis is:

H4: The effect of dispositional motivation on tax research performance will be mediated by knowledge.

To clarify, we do *not* expect knowledge to have a similar mediating effect in issue identification. Instead, the theoretical links between (1) dispositional motivation and knowledge, and (2) knowledge and performance are separate and distinct. We do *not* expect issue identification performance to improve with greater dispositional motivation. Again, the reason is that thinking

harder should not produce technical knowledge one does not possess.[3] In tax research, however, we believe searching harder can compensate to some extent for less knowledge.[4]

While we expect dispositional motivation to produce the hypothesized effects discussed above, this outcome is not a foregone conclusion. Prior studies demonstrating positive relations between dispositional motivation and performance have been conducted in "job performance" settings involving somewhat subjective performance criteria (e.g., supervisory ratings) *and* over a long period of time. Our setting involves a narrower, judgment/decision making task, involving a more objective criterion and a "single-shot" measure of performance. Therefore, whether dispositional motivation will produce the same types of effects in a laboratory-type experiment as in workplace settings (or in single-assignment work settings as opposed to job performance over time) is an open question.

METHOD

We focus on three of the five variables in the model presented in Figure 1—motivation, knowledge, and performance.[5] Participants first completed the motivation instrument. The achievement measure is the seven-item achievement scale derived from the Jenkins Activity Survey (Jenkins et al. 1971) and used in prior research by Spence et al. (1987), Helmreich et al. (1988), and Bluen et al. (1990). As an example, one of the seven questions asks participants to rate themselves ("I consider myself to be…") on a 1-to-5 scale anchored by "Very hard driving and competitive" (1) and "Very relaxed and easy going" (5) (note: this item is reverse-scored).

Achievement scores were computed by summing across the seven achievement scale items. The maximum possible achievement score is 35 and the minimum possible score is 7. Achievement scores for the participants in the present study range from 10 to 35 in the issue identification task (mean = 26.8; std. dev. = 4.6) and from 21 to 31 in the information search task (mean = 26.3; std. dev. = 3.0). After completing this instrument, participants turned to the knowledge portion of the task and then to the performance portion.

Tasks

In the issue identification task, participants completed the General Tax Knowledge Inventory (Roberts 2009), which consists of 100 true/false statements pertaining to a broad range of tax topics. Within this general inventory are subscales of questions that measure knowledge of related tax transactions and topics, for example, Corporate Transactions (six items). An example of one of the statements is: "A Type B reorganization is the acquisition by one corporation of stock in a second (target) corporation in exchange solely for the acquiring corporation's voting stock, if the acquiring corporation has "control" (80 percent ownership) of the target immediately after the exchange." The number of correct answers on the Corporate Transaction subscale provides a measure of task-relevant tax knowledge.

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[3] We distinguish two types of internal information search from memory in which motivation could play distinctly different roles: (1) we do not expect motivation to positively affect information recall for technical knowledge/rules to which one has not been exposed, and which are not possible to deduce from general tax principles; however, (2) we do expect (but do not test here) that motivation may positively affect performance where one has been exposed to tax principles that are applicable to a specific fact situation and the correct application *is* possible to deduce from one or more general principles. The latter is recommended for future research (see, e.g., Earley 2001, 2003).

[4] Barrick and Spilker (2003) demonstrate that knowledge can have direct effects on research performance by helping searchers discriminate between relevant and irrelevant documents, as well as by influencing search strategies (e.g., choosing to restrict search to specific areas of a database). In this paper, we do not examine the extent to which knowledge affects performance through distinguishing relevant and irrelevant documents as opposed to search strategies. Readers interested in this issue should consult Barrick and Spilker (2003).

[5] Roberts and Ashton (2003) previously investigated the effects of general problem-solving ability on tax research performance and failed to find a significant relation. Participants in our study were all in their first year of professional tax practice and, thus, there was not sufficient variation in experience to enable a meaningful test of experience effects.

For the performance portion of the issue identification task, participants read a case and identified relevant tax and business issues related to a corporate split-off and subsequent merger—a "forward triangular merger." The case, adapted from the Carlstrom Products case in Jackson (1997), involves a parent company that establishes a wholly owned subsidiary, capitalizing it with nonvoting preferred stock, for the purpose of acquiring a division of a target company. The target company's shareholders receive nonvoting preferred shares of the parent in exchange for their common stock, and the acquired division is to be merged into the subsidiary after the acquisition. Participants were told to identify and list all of the tax and business issues relevant to each of the parties.

Performance was measured in terms of the number of relevant tax issues identified, a task-specific measure used in previous tax issue identification research (e.g., Bonner et al. 1992). Items relevant to the tax aspects of the case included issues such as meeting the tests of business purpose, continuity of business enterprise, and continuity of ownership.

In the tax research task, participants completed the 20-item Code Structure Inventory (Roberts and Ashton 2003). This inventory involves reading a question and responding by identifying the relevant section of the Internal Revenue Code in which the answer can be found. An example of a question used to elicit knowledge of Internal Revenue Code structure is: "With regard to corporate distributions, must the corporation reduce its earnings and profits for basis or fair market value of property distributed?" Knowledge is measured as the number of questions for which correct Code locations were provided. Following Roberts and Ashton (2003), responses were deemed correct if they were within +/−50 sections *and* were in the correct topical subdivision of the Code.

The performance portion of the information search task required participants to search a commercial tax research electronic database (Commerce Clearinghouse's *Tax Research Network*) to locate the relevant code sections for ten short cases. An example of a case used to assess performance is: "A client has called to ask whether she can take a loss on a futures contract that was purchased at the end of last year. Specifically, the client, a furniture maker, purchased futures contracts for timber in hopes of offsetting, or hedging against, expected increases in timber prices. She wants to know whether there are any adverse tax rules or limitations." To search the database, which contains statutory language that is complex and sometimes obscure, participants must open and scan indexes and menus or retrieve relevant keywords from memory; scan "hit lists" to identify potentially relevant document headings; and open and scan the documents to determine their relevance. A participant might begin searching by using keywords such as "futures contract," "hedging," and "loss" or, if a Code section-oriented approach is followed, by looking in or around section 165 (losses), section 446 (accounting methods), or sections 1221–1223 (determining capital gains and losses).

Participants implemented these search activities using a computerized search instrument consisting of an introductory screen, an instruction screen, and ten case screens. Each case screen presents a tax issue and includes start and finish timer buttons, a response text field for entering the relevant Code section identified, and a button to advance to the next screen.

Performance was measured using a single measure that combines both accuracy and timeliness of information search, as previous research in tax settings has identified both as important (e.g., Spilker 1995; Cloyd 1997; Roberts and Ashton 2003). Research performance for the ten cases was measured as the number of minutes taken to locate all ten Code sections, divided by the number of correct sections located. Thus, the measure represents the average number of minutes needed to locate a correct Code section. We also present supplemental analysis of performance in terms of accuracy and timeliness measured separately.

Participants and Procedures

One hundred two first-year tax consultants (56 females, 46 males) employed by a single Big 4 accounting firm participated. They completed the materials while attending one of two sessions of the firm's initial national training program for tax professionals. The 82 participants attending the first session responded to the issue identification task, while the 20 participants attending the second session responded to the information search task.[6] Participants were working in offices of the participating firm located in all parts of the U.S. Sixty-nine of the 102 participants held master's degrees in taxation, or in accounting with an emphasis in taxation.

Administration of the issue identification task in the first training session occurred in one sitting—including completion of the achievement instrument and the knowledge and performance tasks—with both authors present. Administration of the information search task in the second training session occurred in two sittings, with completion of the achievement instrument on one day and completion of the knowledge and performance tasks two days later. Both authors were present on the first day, and one was present on the second day.

RESULTS

The first hypothesis (H1) maintains that tax accountants whose dispositional motivation is higher will have acquired greater amounts of tax knowledge. We hypothesize this both for knowledge related to the issue identification task, i.e., corporate transaction knowledge, and knowledge for the tax research task, i.e., knowledge of where various tax topics are located in the Internal Revenue Code. The regression results of testing this hypothesis are presented in Table 1, Panel A, for the issue identification task, and in Table 2, Panel A, for the tax research task.[7] The hypothesis is supported in both tasks.

The regression of corporate transaction knowledge (*CTRANS*) on *ACHIEVE* (achievement score) is significant at $p = 0.004$ (Table 1, Panel A). The regression of *ACHIEVE* on Internal Revenue Code (IRC) knowledge (*CODEK*) is also significant at $p = 0.004$ (Table 2, Panel A). The sign of both parameter estimates for *ACHIEVE* are positive, indicating that participants who score higher on achievement also score higher on the knowledge measures, consistent with H1. Splitting participants at the median of achievement scores reveals that participants with above-median scores possess greater knowledge than those with below-median scores: 3.8 (63 percent) versus 3.3 (55 percent) correct responses out of six on corporate transaction knowledge, and 8.1 (41 percent) versus 3.8 (19 percent) correct responses out of 20 on IRC knowledge. Thus, as predicted by H1, beginning tax professionals with higher dispositional motivation possess higher levels of tax knowledge.

H2 predicts that superior task-relevant knowledge in both tasks is positively related to superior performance. We regressed the number of relevant tax issues identified (*ISS-ID*) on participants' corporate transaction knowledge (*CTRANS*); results are shown in Table 1, Panel B. We regressed tax research performance (*RES-PERF*) on Internal Revenue Code topic-location knowledge (*CODEK*); results are shown in Table 2, Panel B. For tax issue identification, the knowledge measure significantly predicts performance at $p = 0.002$. For tax research performance, the knowledge measure significantly predicts performance at $p = 0.003$.

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[6] The difference in numbers of participants in the two tasks resulted from the number of attendees at the two national training sessions at which we were permitted to conduct the experiment by the participating firm. There is no systematic reason for the difference in the numbers of attendees as far as we are aware, i.e., the number of attendees was determined by the firm. Participation in the experimental tasks at each of the two sessions was required for all of the attendees at each session.

[7] One-tailed t-tests are used in testing the hypotheses because the hypotheses are directional.

TABLE 1

Effects of Motivation and Acquisition of Corporate Transactions Knowledge on Issue Identification Performance

Panel A: Regression of Corporate Transactions Knowledge [*CTRANS*] on Motivation

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	1.17	0.85	1.38	0.17
ACHIEVE	1	0.09	0.03	2.77	0.004 H1

Panel B: Regression of Issue Identification Performance [*ISS-ID*] on Knowledge

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	2.60	0.63	4.12	<0.0001
CTRANS	1	0.49	0.17	2.91	0.002 H2a

Panel C: Regression of Issue Identification Performance [*ISS-ID*] on Motivation and Knowledge

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	3.30	0.63	4.12	<0.0001
ACHIEVE	1	−0.03	0.05	−0.57	0.57 H3a
CTRANS	1	0.52	0.18	2.94	0.002 H2a

(continued on next page)

Panel D: Means and Standard Deviations for Motivation, Knowledge and Issue Identification Performance

ACHIEVE Level		*CTRANS* Level: High (n = 21) Mean	Std	*CTRANS* Level: Low (n = 16) Mean	Std
High	*ISS-ID*	5.24	2.21	3.50	1.75
	CTRANS	4.73	0.63	2.44	0.96
	ACHIEVE	31.36	2.26	29.50	1.71
		(n = 19)		**(n = 24)**	
		Mean	**Std**	**Mean**	**Std**
Low	*ISS-ID*	4.95	2.39	3.54	1.59
	CTRANS	4.53	0.70	2.32	0.69
	ACHIEVE	23.79	3.14	23.28	3.70

Variable Definitions:
ACHIEVE = each participant's score on the achievement striving scale of the Jenkins Activity Survey;
CTRANS = number of correct answers on the Corporate Transactions subscale of the General Tax Knowledge Inventory; and
ISS-ID = number of relevant tax issues identified in the forward triangular merger issue identification case.

TABLE 2

Effects of Motivation and Internal Revenue Code Knowledge on Tax Research Performance

Panel A: Regression of Internal Revenue Code Knowledge [*CODEK*] on Motivation

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	−15.51	7.28	−2.13	0.05
ACHIEVE	1	0.81	0.28	2.94	0.004 H1

Panel B: Regression of Tax Research Performance [*RES-PERF*] on Knowledge

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	20.70	2.59	7.98	<0.0001
CODEK	1	−1.16	0.37	−3.17	0.003 H2b

Panel C: Regression of Tax Research Performance [*RES-PERF*] on Motivation

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	51.36	14.78	3.47	0.003
ACHIEVE	1	−1.42	0.56	−2.54	0.01 H3b

Panel D: Regression of Tax Research Performance on Knowledge and Motivation

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	37.73	15.34	2.46	0.02
CODEK	1	−0.88	0.44	−1.98	0.03 H4
ACHIEVE	1	−0.71	0.63	−1.13	0.28 H4

(continued on next page)

Panel E: Means and Standard Deviations for Motivation, Knowledge and Tax Research Performance

ACHIEVE Level		*CODEK* Level: High (n = 6) Mean	High (n = 6) Std	*CODEK* Level: Low (n = 3) Mean	Low (n = 3) Std
High	*RES-PERF*	8.11	3.33	13.04	10.01
	CODEK	10.17	3.60	4.00	0
	ACHIEVE	28.83	1.83	28.67	2.08
		(n = 5)		**(n = 6)**	
		Mean	**Std**	**Mean**	**Std**
Low	*RES-PERF*	11.40	4.36	22.56	7.13
	CODEK	6.80	1.79	1.33	1.37
	ACHIEVE	24.20	2.49	24.17	1.47

Variable Definitions:
ACHIEVE = each participant's score on the achievement striving scale of the Jenkins Activity Survey;
CODEK = number of correct answers on the Code Structure Inventory; and
RES-PERF = total number of search minutes divided by the number of relevant Internal Revenue Code sections located for ten research problems.

The parameter estimate for issue identification is positive, indicating participants with more task-relevant knowledge identify more relevant tax issues; the parameter estimate for tax research performance is negative, indicating participants with more IRC knowledge either (1) take less time to identify the same number of correct Code sections, or (2) identify more correct Code sections for a given amount of time. We explore these possibilities further below. For both tasks, the effects are in the expected directions. Dichotomizing at the median of *CTRANS* for the issue identification task, participants with more knowledge identified a mean of 5.1 relevant tax issues; those with less knowledge identified 3.5 relevant issues. Dichotomizing at the median of *CODEK* for the tax research task, participants with more knowledge needed a mean of only 9.6 minutes to find correct Code sections; those with less knowledge required 19.4 minutes. Thus, both H2a and H2b are supported for both tasks.

Descriptive statistics for the issue identification task are shown in Table 1, Panel D. We split the participant group at the median for both dispositional motivation (*ACHIEVE*) and knowledge (*CTRANS*). As expected, the mean number of relevant tax issues identified by those higher in task-relevant knowledge (5.24 and 4.95), is greater than the mean number of relevant tax issues identified by those lower in task-relevant knowledge (3.50 and 3.54).

Achievement alone is not directly related to tax issue identification performance (H3a). Regression of relevant tax issues identified on *ACHIEVE* is insignificant ($p = 0.80$). The difference in mean number of relevant tax issues identified in the forward triangular merger case for above/below-median scorers on achievement ($4.5 - 4.2 = 0.3$) also is not significant ($p > 0.10$). In addition, Table 1, Panel C, shows the results of regressing tax issue identification performance on both motivation (*ACHIEVE*) and knowledge (*CTRANS*). Knowledge (*CTRANS*) remains significant ($p = 0.002$), while motivation (*ACHIEVE*) is not ($p = 0.57$).

We tested H3b, i.e., dispositional motivation positively affects tax research performance, by regressing our measure of tax research performance (*RES-PERF*, the total number of search minutes divided by the total number of correct IRC sections located) on our measure of dispositional motivation (*ACHIEVE*). As shown in Table 2, Panel C, *ACHIEVE* significantly predicts research performance at $p = 0.01$, thus supporting H3b. As predicted, the parameter estimate sign is negative, indicating participants with higher scores on the dispositional motivation measure either were faster or located more correct tax authorities, or both (we discuss these possibilities further below).

H4 predicts the effects of dispositional motivation on tax research performance are mediated by knowledge. As explained by Baron and Kenny (1986), three conditions must hold to demonstrate mediation: (1) the independent variable (*ACHIEVE*) must be significantly associated with the presumed mediator variable (*CODEK*), (2) the independent variable must be significantly associated with the dependent variable (*RES-PERF*), and (3) the mediator variable must still be significantly associated with the dependent variable after controlling for the effect of the independent variable, while the previously significant association between the independent and dependent variables is no longer significant. To test for mediation, Baron and Kenny (1986) suggest estimating the following three regression equations: first, regress the mediator on the independent variable; second, regress the dependent variable on the independent variable; and third, regress the dependent variable on both the independent variable and the mediator variable. Mediation is established if the independent variable affects the mediator in the first equation, the independent variable affects the dependent variable in the second equation, and the mediator affects the dependent variable in the third equation while the independent variable does not.

The regressions reported in Table 2, Panels A and C, indicate the first two requirements are met: *ACHIEVE* significantly affects *CODEK* ($p = .004$, Panel A), and *ACHIEVE* significantly affects *RES-PERF* ($p = .01$, Panel C). Panel D of Table 2 reveals the third requirement is also met: When both *ACHIEVE* and *CODEK* are included in the same regression, *CODEK* remains signifi-

cant (p = 0.03), but *ACHIEVE* does not (p = 0.28). Thus, H4 is supported, and we conclude the effects of dispositional motivation on tax research performance are mediated by tax research-relevant knowledge, in this case, knowledge of topic location in the IRC.

Descriptive statistics for the tax research task are shown in Table 2, Panel E. We split the participant group at the median for both dispositional motivation (*ACHIEVE*) and knowledge (*CODEK*). As expected, mean research performance for the group high in both motivation and knowledge is best at 8.11 search minutes per correct answer, mean search performance for the group low in both motivation and knowledge is worst at 22.56 minutes per correct answer, and the two mixed motivation and knowledge groups fall in between at 11.4 and 13.04 minutes per correct answer.

Table 3 presents a correlation matrix for the dispositional motivation, knowledge, and performance variables of interest for the tax research task. We present the three variables already discussed (*ACHIEVE*, *CODEK*, and *RES-PERF*) plus *ACCURACY* (the total number of relevant Internal Revenue Code sections located for the ten research problems) and *TIMELINESS* (the total number of search minutes for the ten research problems). The correlations between dispositional motivation and the two disaggregated performance measures are similar to the correlation between motivation and the combined performance variable (0.47 and −0.55 for *ACCURACY* and *TIMELINESS*, respectively, versus −0.51 for *RES-PERF*). Likewise, the correlations between IRC knowledge and the two disaggregated performance measures are similar to the correlation between motivation and the combined performance variable (0.63 and −0.50 for *ACCURACY* and *TIMELINESS*, respectively, versus −0.60 for *RES-PERF*). Thus, we conclude our results for H1–H4 for tax research performance when measured using a combined accuracy/timeliness measure also hold when performance is disaggregated and defined as accuracy or timeliness; tax professionals who are more highly motivated and more knowledgeable about topic location in the IRC perform both more effectively and more efficiently than those who are less highly motivated and/or less knowledgeable.

TABLE 3

Motivation, Knowledge, and Alternative Tax Research Performance Measures Correlations (and p-values)

	ACHIEVE	*CODEK*	*RES-PERF*	*ACCURACY*
CODEK	0.57			
	0.009			
RES-PERF	−0.51	−0.60		
	0.01	0.003		
ACCURACY	0.47	0.63	−0.91	
	0.02	0.002	<0.0001	
TIMELINESS	−0.55	−0.50	0.67	−0.49
	0.005	0.01	0.001	0.03

Variable Definitions:
CODEK = number of correct answers on the Code Structure Knowledge Inventory;
ACHIEVE = each participant's score on the achievement striving scale of the Jenkins Activity Survey;
RES-PERF = total number of search minutes divided by the number of relevant Internal Revenue Code sections located for ten research problems;
ACCURACY = total number of relevant Internal Revenue Code sections located for ten research problems; and
TIMELINESS = total number of search minutes for ten research problems.

SUPPLEMENTAL ANALYSIS: EFFECTS OF MOTIVATION AND EXPERIENCE ON KNOWLEDGE ACQUISITION

Libby and Luft (1993) regard academic training as equivalent to work experience insofar as both represent learning opportunities, i.e., opportunities to acquire knowledge. As shown in Figure 1, knowledge is the expected product of both motivation and experience. While we intentionally selected entry-level tax professionals to control for differences in work experience, our participants do differ in terms of academic training. Thus, our results presented above for the effects of dispositional motivation on knowledge and performance could be affected by omitted variables bias.

To examine this possibility, we performed additional analyses for knowledge and performance for the 82 participants in the issue identification task.[8] First, we regressed experience (*DEGREE*, a dummy variable for each participant's highest earned degree: 0 = undergraduate, 1 = graduate) on motivation (*ACHIEVE*) to determine whether higher-motivated individuals earn graduate degrees (attain greater experience). Next, we regressed corporate transaction knowledge (*CTRANS*) on experience (*DEGREE*) to determine whether increased experience (tax academic training) leads to greater corporate transaction knowledge. Third, we regressed corporate transaction knowledge on both motivation and experience to determine whether motivation remains significant, as in our earlier results (e.g., Table 1). The results are shown in Panels A, B, and C of Table 4.

As shown in Panel A of Table 4, dispositional motivation significantly explains who earns a graduate degree and who does not ($p = 0.024$). Attaining a graduate degree, in turn, leads to greater knowledge (Panel B, $p < 0.0001$). Both motivation ($p = 0.041$) and experience ($p < 0.0001$) are significant in predicting greater knowledge (Panel C). Thus, although experience, measured as possessing a graduate degree, is highly significant in explaining which participants possess greater tax knowledge, motivation remains significant ($p < 0.05$) even when experience (graduate degree) is included in the model. Thus, we conclude our earlier results are not affected by omitted variables bias.

We also repeated our earlier analyses for the 51 participants in the issue identification task who possess graduate degrees—i.e., holding experience (academic training) constant. These results are shown in Panels D, E, and F of Table 4. Consistent with the results shown for all participants in Table 1, when the analysis is restricted to participants with graduate degrees only, we find:

(1) Motivation significantly predicts knowledge acquisition ($p = 0.017$, Panel D),
(2) Knowledge significantly predicts issue identification performance ($p = 0.033$, Panel E), and
(3) Knowledge ($p = 0.026$), but not motivation ($p = 0.49$), predicts issue identification performance when the regression model includes both variables (Panel F).

These results are consistent with the results for all participants in the issue identification task, confirming our conclusion that our earlier results for the issue identification task are not the result of omitted variables bias.[9]

DISCUSSION, CONCLUSIONS, AND FUTURE RESEARCH

Based on analyses of the characteristics of tasks in which situational sources of motivation have been found effective, and not effective, for improving performance, we hypothesized and

[8] All 20 participants in the research task possessed graduate degrees, so we were unable to test for separate effects of graduate/undergraduate degree for those participants.

[9] We performed the same regressions for the 31 participants with bachelor's degrees and found: (1) motivation did *not* significantly predict corporate transaction knowledge ($p = 0.95$), and (2) corporate transaction knowledge did *not* significantly predict issue identification performance ($p = 0.77$). Neither result is surprising, since undergraduate tax courses do not address corporate transactions in as great a depth as graduate tax courses.

TABLE 4

Effects of Motivation and Experience on Acquisition of Corporate Transactions Knowledge

Panel A: Regression of Experience [*DEGREE*] on Motivation (all issue identification participants)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	−0.04	0.35	−0.13	0.90
ACHIEVE	1	0.02	0.01	1.93	0.024

Panel B: Regression of Corporate Transaction Knowledge [*CTRANS*] on Experience (all issue identification participants)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	2.68	0.21	12.59	<0.0001
DEGREE	1	1.36	0.27	5.04	<0.0001

Panel C: Regression of Corporate Transaction Knowledge [CTRANS] on Motivation and Experience (all issue identification participants)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	1.24	0.84	1.48	0.14
ACHIEVE	1	0.06	0.03	1.76	0.041
DEGREE	1	1.26	0.27	4.61	<0.0001

Panel D: Regression of Corporate Transactions Knowledge [*CTRANS*] on Motivation (participants with graduate degrees only)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	1.86	0.95	1.96	0.06
ACHIEVE	1	0.08	0.03	2.34	0.017

Panel E: Regression of Issue Identification Performance [*ISS-ID*] on Knowledge (participants with graduate degrees only)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	2.74	1.21	2.26	0.03
CTRANS	1	0.54	0.29	1.89	0.033

(continued on next page)

Panel F: Regression of Issue Identification Performance [*ISS-ID*] on Motivation and Knowledge (participants with graduate degrees only)

Variable	DF	Parameter Estimate	Standard Error	t-value	Pr > |t|
Intercept	1	3.93	2.10	1.88	0.07
ACHIEVE	1	−0.05	0.07	−0.70	0.49
CTRANS	1	0.60	0.30	2.00	0.026

Variable Definitions:
ACHIEVE = each participant's score on the achievement striving scale of the Jenkins Activity Survey;
DEGREE = a 0/1 dummy variable for each participant's highest earned degree (undergraduate = 0, graduate = 1); and
CTRANS = number of correct answers on the Corporate Transactions subscale of the General Tax Knowledge Inventory.

found that a measure of dispositional motivation, achievement, is associated with greater task-relevant tax knowledge for issue identification and tax research, and that the resulting knowledge, in turn, is associated with superior performance in both tax issue identification and information search tasks. We also found achievement has a direct association with performance in the tax research task. Both the effectiveness (accuracy) and efficiency (timeliness) of tax research performance are greater for participants higher in achievement. In contrast to the results for tax research, and demonstrating that dispositional motivation does not have the same effect on all aspects of judgment/decision performance, achievement is associated with issue identification performance only via its influence on knowledge.

Understanding dispositional motivation effects is important for understanding decision makers' behavior. For researchers, understanding dispositional motivation is important both for reducing noise when studying other influences on performance (i.e., using dispositional motivation as a control variable) as well as studying the effects of motivation as the primary variable of interest. This paper highlights one important difference between dispositional motivation and situational motivation (e.g., financial incentives or accountability): Dispositional motivation affects knowledge acquisition over time. Since task-relevant knowledge is the major characteristic that distinguishes experts from novices (Ericsson and Smith 1991), when experimental participants have had prior, and varying, opportunities to acquire task-relevant knowledge prior to administration of an experiment, the results of this study suggest participants higher in achievement will have taken advantage of those opportunities and, as a result, will possess more knowledge that will aid their decision-making performance. Situational motivation induced during the experiment may have a similar effect to dispositional, achievement motivation *during* the course of the experiment, but situational motivation induced during the experiment will *not* likely predict which participants arrive at the experiment possessing more task-relevant knowledge.

Our results suggest many avenues for additional research. Some examples are: To what extent is dispositional motivation related to performance that depends on cognitive activities other than issue identification and information search (e.g., information evaluation, judgment, choice)? For example, is dispositional motivation important for effective performance in the analytical task of evaluating analogous tax authorities as examined in Magro and Nutter (2009)? To what extent is the association between dispositional motivation and performance moderated by characteristics of the task (e.g., feedback), the person (e.g., ability), and elements of the task/person system (e.g., job autonomy, self-efficacy)? Is there a threshold for dispositional motivation, above which higher amounts do not produce better performance? In other tasks, to what extent is dispositional motivation effective for stimulating the learning that is required to improve long-term performance, as opposed to inducing the intensity and duration of effort necessary for short-term performance? In multi-task settings (and single-task settings involving multiple task dimensions) where effort must be allocated across tasks (or dimensions), does dispositional motivation lessen the tendency found with situational motivators to focus attention toward rewarded tasks (or dimensions) and away from unrewarded ones? Under what circumstances are high levels of dispositional motivation *detrimental* to performance? For example, is higher achievement more likely to produce confirmation bias when evaluating the relevance of tax authorities (i.e., emphasizing tax authorities favorable to the client) (Davis and Mason 2003)? What are the *relative* contributions to performance of dispositional and situational sources of motivation, and what are the *joint* effects on performance of dispositional and situational sources of motivation? For what types of tasks do individuals with high scores on the methodicalness facet of conscientiousness perform better than individuals with high scores on achievement?

A meta-analysis conducted by Hough (1992) found not only that performance is highly associated with achievement, but that *effort*, which links motivation to performance, is also highly associated with achievement. Prior research indicates motivation affects performance via effort

(Thomas 1983), and it has long been recognized that effort reflects a combination of direction, intensity, and duration (Mace 1935; Kanfer 1990). Direction refers to the initial choice to expend effort; intensity refers to the choice of effort level expended; and duration refers to the choice to continue in that expenditure (Campbell 1990). Thus, future research should also consider ways to measure these distinct components of motivation and their consequences (this is easier to contemplate for observable tasks such as information search than for more difficult, nonobservable tasks such as issue identification).

Future research should also examine the implications of dispositional motivation for selecting and training individuals, and for assigning them to tasks, in particular performance settings. Dispositional motivation could be an important screening tool for hiring and assigning new employees. Trade-offs between dispositional motivation and, say, ability, are relevant for human resources issues in accounting settings. For example, to what extent can working harder versus working smarter result in equally effective and efficient job performance, not only in tax practice (the context of this study) but also in auditing and other professional settings? In short, much work remains to be done to understand the effects of dispositional motivation on individual performance in accounting tasks.

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