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The Motivation Beliefs Inventory: Measuring Motivation Beliefs Using Four Motivation Theories

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THE MOTIVATION BELIEFS INVENTORY:
MEASURING MOTIVATION BELIEFS USING FOUR MOTIVATION THEORIES

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of

Doctor of Philosophy

May 2012

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ABSTRACT

Among organizational consultants, human resources practitioners, and

organizational leaders, there has been a resurgence of interest in the subject of employee

motivation, in part due to the best-selling book, *Drive* (Pink, 2009). In this book, the

author challenged readers to question their beliefs about what motivates employees; this

challenge was based on research that questions the validity of widely used management

approaches to employee motivation, particularly those based on reinforcement theory.

Answering this challenge was difficult, however, given the lack of instruments designed

to measure motivation beliefs at all, much less beliefs from a range of prevalent theories.

Using principal components and parallel analyses, the 20-item Motivation Beliefs

Inventory (MBI) was created to measure motivation beliefs along four theoretical lines:

reinforcement theory; expectancy-valence theory; achievement motivation theory; and

self-determination theory. The instrument was validated in two tests involving large

samples of businesspeople. Validity and reliability analyses revealed the instrument

demonstrates acceptable psychometric properties. Four subscales, each representing a

single theory, were confirmed and demonstrated alpha coefficients as follows:

reinforcement theory, .77; expectancy-valence theory, .71; achievement motivation

theory, .82; self-determination theory, .77. The entire Motivation Beliefs Inventory

produced a strong alpha coefficient of .77.

In addition to validating the instrument, this study generated several significant

findings. The first of these revealed that there were statistically significant differences in

the distribution of beliefs about what motivates employees; specifically, self-

determination beliefs were most strongly held, followed by expectancy-valence theory

and achievement motivation theory beliefs. Despite their dominant role in organizational systems, respondents agreed with tenets of reinforcement theory at the lowest level. Furthermore, based on effect size analysis, males were more likely than females to agree with reinforcement theory and achievement motivation theory, while non-managers were more likely than managers to agree with self-determination theory.

As expected, the creation of a new instrument like the MBI opens a world of possibilities for both practitioners and scholars. While workplace practitioners now have the ability to actually measure an individual's beliefs about motivation, researchers can use the instrument to test for differences in these beliefs among individuals in different occupations, companies, industries, and countries.

DEDICATION

To Drea. Needless to say . . . .

ACKNOWLEDGEMENTS

It is my honor to heartily—if meagerly—return some of the energy the following people have shared with me during my doctoral studies, and the completion of this dissertation.

To Dr. Fred Galloway, my advisor, but more than that, a man, whose prodigious mind for all things statistics is dwarfed by his optimistic, generous, and seemingly indefatigable spirit. Thank you.

For allowing me to fuel up and rejuvenate at their wells of warmth and incisive guidance, Dr. Noriyuki Inoue, and Dr. Robert Donmoyer—thank you.

Many others have shared their insights and warmth with me during my journey: Emily Marx; Taylor Peyton-Roberts; Kathleen Gallagher; Audrey Barrett; Dobie Houson; Susan Fowler; Wendy Tuttle; my dear father, David Facer Sr.; the global community of motivation researchers; the many remote and departed deep thinkers whose ideas have awakened my mind and spirit over the years; my University of San Diego colleagues; and my lovely, powerful sister, Michele Van Sciver. Thank you, all.

In addition to my earlier dedication to Drea Zigarmi, I also dedicate this study to employees and managers in human resources, learning and development, and all other functional areas, organizational consultants, executive coaches, and both undergraduate and graduate educators who dare challenge conventional thinking about how everyday business could possibly be conducted while pursuing profit. I have your back. May you—may we all—remain lovingly resolute to further illuminate the psycho-social dimensions of organizational life so that work is an uplifting, growthful, and holistically

enriching experience for *all* employees, and the many stakeholders touched by their

contributions. The business system does not make it easy, yet I believe it is a good and

true effort vital to the enhancement of all of life everywhere.

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CHAPTER ONE

BACKGROUND AND PURPOSE OF THE STUDY

The subject of employee motivation is enjoying a surge of interest today. One reason is a recent bestselling book, *Drive* (Pink, 2009), that looks at the gap between what some of the most current psychology research says motivates employees and the apparently different premises upon which organizational systems and management practices are based. The author is finding an eager audience among business executives, human resource practitioners, and learning and development consultants alike. This is interesting considering the book's provocative assertion—that managers' outdated beliefs about motivation need to change if managers want to free themselves, their employees, and their organizations from many chronic problems, and achieve the positive outcomes they profess to value.

The motivation gap Pink highlights and its proposed solution—that managers change their beliefs—is different from how motivation in general, and employee motivation in particular, has traditionally been approached. Indeed, personality and social psychologists have explored questions about what motivates employees to perform in their jobs since the early years of the industrial revolution. Typically, motivation research has examined what motivates an individual to initiate, persist, and cease activity in a given context such as a school or work organization. The issue Pink highlights, though, is not based on research's ignorance of what actually motivates an employee or a person generally. The issue we are urged to look at deals with what managers *believe* motivates employees.

Motivation Research

Motivation research has tended to emphasize what conditions correlate with initiation and persistence of behavior, the nature and expanse of human needs, and the influence of environmental conditions on need stimulation and satisfaction. For example, early motivation theory offered explanations of all human action as a predictable and controllable response to reinforcements (Skinner, 1974; Watson, 1924). More recently, having repudiated reinforcement theory as a sufficient explanation of human motivation, other researchers have proposed that humans decide to act or not based on the utility they perceive the activity to have given their goals (Vroom, 1964). McClelland (1985) went further and proposed that humans decide to act in order to satisfy acquired psychological needs such as the need for achievement, the need for affiliation, and the need for power. Today, the theory lauded in Pink's book, self-determination theory (SDT; Deci & Ryan, 2000), is a meta-theory that aims to describe human functioning generally. According to SDT, a person engages and persists in an activity based on the extent to which innate psychological needs for autonomy, relatedness, and competence are satisfied or thwarted. Researchers have validated SDT in a wide variety of functional domains such as work and organization (Gagné & Deci, 2005), sport and exercise (Adie, Duda, & Ntoumanis, 2008), patient health (Williams, 2002), education and teaching (Reeve, 2002), parenting (Grolnick & Apostoleris, 2002), and environmentalism (Pelletier, 2002).

A review of the research confirms that the dimension of motivation within the organizational domain that is rarely addressed by the aforementioned motivation theories is managers' beliefs about what motivates others. This is an important omission given

that managers' beliefs flow into not only decisions about the structure and content of organizational systems such as reward, recognition, and compensation (McGregor, 2005), but also how managers approach individual employees in the course of decision making, goal setting, and other day-to-day interactions (Pelletier & Vallerand, 1996).

A recent "state of the theory" article further punctuates the paucity of research into manager motivation beliefs by prominent SDT researchers (Vallerand, Pelletier, & Koestner, 2008). That article contains no fewer than ten calls for future research on a wide range of subjects germane to work motivation. Examples include a call for more research into the need for relatedness, how motivation is experienced at the domain level (i.e., one's job) and at the situational level (i.e., a task or project within one's job), and how one might change his or her motivation over time. Despite these many calls for further research, almost none has been for research into beliefs about motivation. But, amid the general lack of focus on managers' motivation beliefs, there are a few exceptions.

The first such exception was the periodic study (Kovach, 1987) in which managers were asked to rank a set list of interpersonal and job characteristics from most important to least important, first in reference to themselves, and then based on what they thought motivates employees. The lists included items such as meaningful work, tactful discipline, good wages, and receiving full appreciation for work done (p. 60). The result was two ranked lists, one for beliefs about what motivates employees and one for managers. The purpose of such studies was to learn if managers think employees were motivated by different factors than motivated the manager. But, while motivation and

personality theories were mentioned in the analysis of the differences between the two lists, most of the analyses contained a discussion of what the findings might mean. The lists were not coded against motivation theories. So, while such "motive-by-motive" studies offer some data about what managers believe motivates employees and themselves, the analysis for the most part has led to surmising why the lists perhaps were ranked as they were, and a call for more research into manager beliefs.

There are two studies in the SDT literature that discuss beliefs. One study refers specifically to managers. The other refers to the beliefs teachers hold about students. The latter study, curiously, comes from the authors of the 2008 "state of the theory" article by Vallerand et al. (2008) mentioned earlier. The first of the two SDT studies is in an article by Stone, Deci, and Ryan (2009) in which the authors recall two successful SDT-based management interventions, one at a corporation and another in a city school system. But, once again, the study recalls actual changes that resulted from use of the theory's principles. Only in the article summary and conclusion do the authors hypothesize that implementing SDT principles "challenges managers' long-held beliefs about human motivation" (p. 88). The authors emphasize that long-held beliefs about the positive effect of control on individual motivation persist despite substantial empirical evidence that humans thrive under conditions of freedom from undue pressure, surveillance, and other forms of external control (Baard, Deci, & Ryan, 2004). Nonetheless, no call for research into manager motivation beliefs follows. Instead, the authors rhetorically ask what better legacy management could leave than supporting employee growth and well-being as SDT suggests.

The second SDT study that discussed beliefs was a study by Pelletier and Vallerand (1996) in the education domain. In that study, researchers examined the relationship between teacher beliefs and expectations about a student's motivation type— either intrinsic or extrinsic—and the behaviors those teachers used toward that student. In that study, it was found that a teacher's initial assumptions about what motivated a student led to attitudes and behavior toward that student that resulted in student behavior that confirmed the teacher's initial beliefs. In other words, a teacher who believes that a student engages in a project willingly because the student enjoys it, finds it challenging, and wants to learn as much as possible—all manifestations of intrinsic motivation—will use behavior toward that student that further supports that student's interest, freedom, and enjoyment. If generalizable, imagine the ramifications of this finding when a manager incorrectly believes an employee is *not* intrinsically motivated toward a project. The manager effectively acts out a personal lay theory about the employee's motivation (Heath, 1999). More precisely, the manager would be acting upon an embedded belief within the lay theory called an extrinsic incentive bias (Heath, 1999, p. 28). The manager would then respond with behaviors associated with extrinsic motivation, such as control, use of external inducements, and no consideration of what might sustain or further the employee's inherent interest in or enjoyment of the project.

These important exceptions to the scant focus on managers' beliefs in the motivation research begin to link Pink's call to examine managers' basic assumptions about what motivates employees and the purpose of this study. But first, it will help to

briefly discuss some ways manager beliefs about employees have been addressed in organizational research.

Organizational Research

Whereas manager beliefs have received limited focus within the motivation frameworks mentioned earlier, organizational researchers have consistently examined the beliefs held by organization members and the impact of those beliefs on individual, interpersonal, group, and organizational outcomes. Schein (2004) discusses beliefs at the collective level as a foundation of organizational culture. Baron, Burton, and Hannan (1996) looked at how beliefs held by company founders about what motivates employees influenced the systems and structure within their firms. Argyris (1960) built on Rousseau's 18th-century concept of a social contract when postulating a psychological contract between management and employees. Such a contract goes beyond motivational beliefs in that it is a broad, often implicit framework of responsibilities and obligations between managers and employees within the work experience (Rousseau, 2001). For decades, Senge (1990) has researched how individual and shared schema and schemata—or mental models—guide attitudes about others and the organization, intentions for behavior, and individual and collective action within a learning organization. More recently, in a working paper, Bidwell and Burton (2006) examined the impact of managers' assumptions about employees' reward expectations on the relationship those employees had with the organization.

While some of the organizational approaches to manager beliefs extend beyond motivation, McGregor's (2005) Theory X/Theory Y framework provides a meaningful

bridge between beliefs held by managers about an employee's motivation, the structure and content of organizational systems, and the employee's actual motivation. Fifty years ago, McGregor proposed that a manager's behavior toward employees would depend on the manager's beliefs about people's motivation for work generally. He suggested that there are two mutually exclusive points of view. The first, called Theory X, is rooted in a belief that people are inherently irresponsible and need to be tightly controlled if they are to accomplish anything productive. Theory X managers believe that employees act out of self-interest and so need to be "made" to do collective and organizational work via rewards and punishments (Aubertine, 1976). Organizational environments based on managers' Theory X beliefs are characterized by mistrust (Fisher, 2009).

Theory Y beliefs are antithetical to Theory X beliefs. Managers who believe in Theory Y believe that human beings want to work, eagerly seek responsibility, enjoy participating in the challenges inherent in producing products and services, and so require no coercion to perform (McGregor, 2005, p. 59). Theory Y-based environments are characterized by a mutual trust, and a sense of connectedness and purposeful joint action, especially between managers and employees.

Theory X/Theory Y predates many of the approaches to motivation and organization mentioned earlier, though its frequent citation in even the recent motivation literature Pink (2009) drew upon (e.g., Baaard et al., 2004; Grant, 2008; Kasser, Davey, & Ryan, 1992; Stone et al., 2009) rarely results in a recommendation to research manager beliefs. Still, Theory X/Theory Y is an apt bridge between what the psychological theories of motivation tell us about employee motivation and a potentially new

understanding of the gap highlighted in Pink's bestseller: That practicing managers' beliefs about employee motivation are not only very different than what contemporary motivation research says motivates employees, they are a primary reason why little, if any, new motivation research gets used. Pink's work implies that managers either (a) see the world in equally dualistic X/Y terms, (b) will not implement new motivation science, or (c) because of deeply engrained and unchallenged—indeed unchallengeable assumptions (Argyris, 2006)—cannot implement new motivation knowledge in their organizations.

Problem Statement

This study is grounded in the premise that one reason advancements in scientific knowledge about employee motivation have had too little impact within organizations is that manager beliefs about employees' motivation both mediate and moderate the practical implementation of such research advancements (McGregor, 2005). When Pink (2009) illuminated the gap between traditional approaches to employee motivation within organizations and the effects those approaches have on employee motivation, he joined McGregor's call—way back in 1960—to examine beliefs about human action, and employee motivation in particular. Both authors provocatively asserted that the prevailing ideas and the systems built on them are out of date when examined in light of the latest motivation science. But knowing there is a gap between how managers act and build organizational systems and what they believe is not enough to transform either manager behavior or organizational systems; we also need to know the *content* of what managers believe. Since many motivation theories have been validated since

McGregor's time, we can now go beyond McGregor's dualistic framing by researching the content of managers' beliefs about employee motivation based on the tenets of several motivation theories.

Purpose of the Study

More specifically, to better illuminate the content of managers' beliefs about motivation, the purpose of this study is to attempt to create a valid, reliable, parsimonious, and multiple theory-based self-report instrument to discern the beliefs managers hold about what motivates employees. To ensure achievability, and to maintain focus on motivation beliefs specifically, the instrument will include the four theoretical frameworks mentioned earlier: reinforcement theory (RT), expectancy-valence theory (EVT), achievement motivation theory (AMT), and self-determination theory (SDT).

Research Questions

This study was centered on two research questions. The first was to what extent can a valid, reliable, brief, and multiple theory-based self-report instrument be created to measure a manager's beliefs about what motivates employees along four theoretical lines: reinforcement theory; expectancy-valence theory; achievement motivation theory; and self-determination theory? The second research question refers to findings. What are the initial findings about motivation beliefs by groups of respondents? More specifically, to what extent do managers' beliefs differ from those of non-managers? And, going further, what other differences, if any, are evident between other respondent groups?

Having established the need for a tool to research motivation beliefs along the lines of major motivation theories, it is apparent a new instrument is needed. Before turning to the specifics of the Motivation Beliefs Inventory (MBI) development and validation processes, it will be helpful to briefly explain the reasons a survey methodology is reasonable. One of many advantages (Fowler, 2009) is practicality; survey distribution, administration, and data collection are accepted in the business domain. Surveys can be administered quickly and widely using computer technology, which allows for easy information gathering from employees in many geographies. Electronically distributed surveys also enable respondents to participate from their places of work. Surveys impose no learning requirements, as their purpose and response methods are easily, even intuitively, understood.

From a data analysis standpoint, surveys allow for uniformity in data collection (Fulmer & Frijters, 2009). Survey data can also be analyzed using off-the-shelf statistics software, enabling standardized inferential analysis (Elliott, 2004). Responses can be analyzed by demographic group (e.g., male/female, manager/non-manager, Ph.D. holders/undergraduates) and also along categories relevant to business itself. Examples include organizations in the same industry, geographical region, or company size. From a practitioner standpoint, the statistical analysis advantages are important. In business, findings inferred from valid survey data are often valued and trusted, particularly when collected from large, representative samples. Finally, as will be seen in the literature review in chapter two, in contemporary psychology research, and motivation research in particular—with the noteworthy exception of the Thematic Apperception Test

(McClelland, 1987) which is relatively difficult to administer—Likert-style question or statement based questionnaires like the one validated in this study are the norm.

Delimitations

Many of the theories related to employee motivation formulated in the past 50 years have been centered on contingency expectations. Expectancy-value theory (Feather, 1992), self-efficacy theory (Bandura, 1997), and goal theory (Locke & Latham, 1990) are three prominent examples. These theories have not been included in the proposed instrument for several reasons. The first reason for their exclusion is the obvious point about parsimony. It is simply not practical to construct an instrument that includes each of the many theoretical frameworks proposed to explain employee motivation, particularly when many theories can be traced to common constructs. The second point is arguably more substantial, and deals with the content of each of the excluded theories.

Expectancy-value theory (Feather, 1992) proposes that individual values incite valences that combine with expectancies to determine action. As such, while expectancy-value theory is an extension of expectancy-valence theory (Vroom, 1995), it is not theoretically distinct enough from one of the included theories—expectancy-valence theory—to warrant inclusion.

Perhaps the most widely known contingency theory, self-efficacy theory (Bandura, 1997) also runs into the common construct issue. Self-efficacy theory proposes that action is determined by the interplay of goals, one's beliefs about one's ability to achieve selected goals, and actions chosen because one believes they will help

achieve those goals while avoiding unwanted outcomes (p. 122). In this sense, it, too, is closely related to expectancy-valence theory, and so has not been included.

The final theory of the contingency variety that might at first glance appear a good fit for the proposed instrument is goal theory (Locke & Latham, 1990). Goal theory might appear a good fit as it focuses on goal selection and achievement. Indeed, such bottom-line focus is the mainstay of organizational life (Deci, 1992), but the decision to exclude it was based on goal theory's main assertions. To explain motivation, goal theory proposes that people will perform at maximum levels when they hold clear and challenging goals (Locke & Latham, 2006). The theory presupposes that challenging goals are inherently more satisfying than less challenging goals, and when achieved result in maximum satisfaction. Goal theory is not a full theory of motivation, however, in that it does not explain on what psychological bases goals are chosen (Deci, 1992). Instead, goal theory is more concerned with what characteristics of a goal create maximum performance and satisfaction—namely specificity and difficulty (Locke & Latham, 1990, p. 29)—than with the internal processes and appraisals (Zigarmi, Nimon, Houson, Witt, & Diehl, 2009) involved in the decision to initiate, persist, or cease action. In a sense, this is akin to reinforcement theory's focus on what external reinforcements influence behavior. Because of this similarity to reinforcement theory and its simultaneous similarity to the expectancy calculation people make about what and whether current behavior will lead to valued outcomes, goal theory has not been included in the proposed instrument.

It is now important to review the literature on the four chosen theories. This will be done in two stages. The first stage—which is next—is a review of the theories themselves. The second stage will be a review of the how each of the theories has been measured, and the lack of focus on managers' beliefs.

CHAPTER TWO

REVIEW OF THE LITERATURE

Motivation Theory Literature

Each of the four motivation theories to be included in this new instrument—

reinforcement theory (RT; Skinner, 1974), expectancy valence theory (EVT; Vroom,

1995), achievement motivation theory (AMT; McClelland, 1987), and self-determination

theory (SDT; Deci & Ryan, 2000)—is a theory of motivation. The four selected theories

also represent motivation science across human experience and beyond the limited

domain of work. This approach echoes Vroom's (1995) suggestion of "a lawfulness in

the behavior of individuals that transcends the boundaries of applied fields" (p. 6). While

the proposed instrument will have its first usage within the domain of management, its

theoretical foundation is broader than that. Furthermore, from a theory-across-time

perspective, reinforcement theory, expectancy theory, achievement motivation theory,

and self-determination theory, in that order, together represent the field of motivation

science from early in 20th century to present day (Reeve, 2009). And, finally, based on

this researcher's professional experience consulting to individual contributors, middle

managers, and senior executives in organizations worldwide, managers' beliefs related to

each of the four theories' basic assumptions are often linked to organizational systems

intended to foster or alter employee motivation, albeit not equally. It may now be useful

to provide an overview of each of the four theories with particular emphasis on how they

relate to employees today.

Reinforcement Theory

While today it is unusual to retrace the history of reinforcement theory, the subject is germane to the proposed instrument because reinforcement theory continues to strongly influence organizational systems. Adding to the vigorous, if broader, debate among some business scholars about the negative effects of the influence of economics on social science (Pfeffer, 2005, p. 97), executives from the large consulting company, McKinsey (Dewhurst, Guthridge, & Mohr, 2010), recently lamented that business leaders intend to reintroduce traditional financial rewards such as executive bonuses as the global economy rebounds despite the deleterious impact such bonus systems had on the global economic downturn in recent years. Such resurgence of traditional managerial approaches to employee motivation is testament to the persistent, if not intractable, belief that "carrots and sticks" lead to appropriate human action in the workplace. And so a brief history will be useful.

Long before the emergence of the modern scientific method, and the science of psychology in particular, Greek philosophers—for example, Socrates, Plato, and Aristotle—wrestled with central questions of motivation science: What causes a person to act? More granularly, how is it that a human being comes to initiate behavior, select among alternative courses of action, persist in the face of obstacles, cease action, or fail to initiate action at all? Philosophers talked of a tripartite soul as the regulating process of human action (Reeve, 2009). The three parts corresponded to involuntary biological functions, pleasure seeking and pain avoidance, and intellect. European philosophers would later call the intellect, *will*.

Descartes, in turn, reduced these three parts to a dualism of body and mind

(Reeve, 2009, p. 26). Like the Greeks, Descartes' conceptualization included a hierarchy

of control with the will situated in the mind and acting as regulator of the lower bodily

functions. This configuration made it possible for humans to make conscious, or free,

choices among alternatives. But a hypothesized free will could not be directly observed,

and claims about its existence could not be verified. Darwin's theory of evolution, and

scientific inquiry more broadly, would eventually allow psychologists to equate human

action and its determinants to that of the lower animals (Skinner, 1974), eliminating the

need for the philosophical will. In fact, will came to be seen as an unnecessary conjuring,

a *mentalism* in Skinner's words, used to explain what could not be explained in terms of

the real science of direct observation.

The reduction of human action to a function of factors no more complex than

those which govern a bird's activity led to behaviorism as it is widely understood today,

and its enduring central tenet: human behavior can be reliably controlled through the use

of incentives. In fact, all human behavior was thought to be the result of the power of

positive and negative incentives to catalyze, sustain, or eliminate human activity.

Reinforcement theorists were primarily interested in the control of human

behavior by highly predictable means (Skinner, 1974, p. 208). This focus on control fit

nicely with the machine metaphor that pervaded conceptualizations about organizations

(Western, 2008), management, and work in the early decades of the industrial revolution.

Anyone working in organizations today can attest that employees at all levels are well

versed in all manner of phrases related to the machine metaphor (p. 87). Beliefs about

the power of reinforcements to invariably deliver predictable—and it is assumed,

positive—results, are alive and well. For this reason, reinforcement theory will be useful

in the proposed instrument. We now turn to the second of the four theories, expectancy

valence theory.

Expectancy Valence Theory

Expectancy valence theory—often called expectancy theory and valence

instrumentality expectancy theory—placed the incentives that reinforcement theorists

believed determined human action into a more complex system that included cognitions.

Expectancy valence theory was made possible because of the cognitive revolution in

psychology (Shah & Gardner, 2008). The "mentalisms" that Skinner (1974) maintained

had no relevance in the system of human behavior—such as affect, thought, attention,

and memory—were put at the very heart of the exploration of what caused human beings

to make conscious, and not merely reflexive, decisions to engage in purposive behavior

(Shaw & Gardner, 2008, p. 14). Because expectancy-valence theory was originally

conceived to refer to workplace behavior, it was quickly influential with organizational

development researchers and management practitioners (Locke, 1975). Expectancy

valence theory did not replace reinforcement theory, however, any more than a new

theory typically supplants its predecessors upon inception (Markóczy & Deeds, 2009).

Instead, building on reinforcement theory, expectancy theorists still saw the relevance of

incentives to action, but only as the individual perceived them. Individual action amidst

external conditions, then, was theorized to be not a deterministic, invariant and easily

controlled response to those conditions, but rather the result of one's subjective experience of such conditions.

Expectancy valence theory's epistemology, therefore, was fundamentally different from that of reinforcement theory. As a social cognitive theory, expectancy theorists essentially joined the philosophers by approaching human beings not as mere responders to stimuli as a Darwinian or behaviorist might argue, but rather as appraisers of their experience. Such appraisals result in subjective meaning (Shamir, 1991). Subjective appraisals also allowed for choice among alternatives.

Empirically, Vroom (1995) conceptualized choiceful behavior as a function of three variables: valence, instrumentality, and expectancy. In everyday terms, valence is the emotional desirability, attractiveness, and anticipated satisfaction of a particular outcome (Van Eerde & Thierry, 1996). When managers take an interest in whether an employee wants to take on a role project, or task, they consider the valence that task has to the employee.

Based on Vroom's (1995) original conceptualization, instrumentality and expectancy are less clear than valence, and are easily confused—and are equally central to the decisions employees make. Expectancy valence theory sees the individual, say, a manager, as making estimates of the likelihood that the action he or she is considering in the current moment will bring about a desired outcome at a future moment. The estimates include two types of outcomes, one following close in time from the initial action, and another occurring at some later time. The estimates that an action will lead to an intermediate outcome or to an outcome later in time are termed instrumentality and

expectancy, respectively. For the remainder of this summary, though, I will use the term expectancy, since it is closest to the everyday language of managers—who want to know what they can *expect* to result from their actions. Indeed, managerial work is an ongoing attempt to maximize the probability that actions contemplated or taken in the present moment will deliver desired results in the future. Such calculations lie at the heart of all manner of organizational decisions, such as how much to spend on research and development, whether to enter a new market, and whether to hire—or fire—an employee.

Overall, the important contribution of EVT to our understanding of if people will act, and why, is its insistence that people choose to act based on a combination of individual appraisals about the attractiveness of possible actions and the likelihood that those actions will result in desired outcomes. The next reasonable question to ask is, to what ends do people act? What are they trying to achieve? To answer that question, we turn to the third of the four theories included in the instrument, achievement motivation theory.

Achievement Motivation Theory

Building on Atkinson's (1978) work, among others, McClelland (1987) surmised that people act to satisfy needs. Even though, like Vroom, McClelland's achievement motivation theory was originally aimed at the domain of work, he took the discussion in broader directions. Achievement in the workplace is about producing some kind of output. But that meaning does not capture the richness of achievement as defined in achievement motivation theory. Achievement motivation theory adds dimensions of complexity and explanatory power relative to expectancy theory. Achievement

motivation theory hypothesizes that people act not only as a function of the pleasantness

and calculated utility of various actions amidst options; they act to satisfy a limited set of

needs.

First, and more specifically, AMT went further down the road of individual

differences than did expectancy theory by suggesting that people act to satisfy individual

needs for achievement, affiliation, and power (Pinder, 2008). Second, achievement

motivation proposed that such needs are universal to the human condition. Achievement

motivation theorists propose that human beings acquire the needs for achievement,

affiliation, and power via socialization over time. The original monikers for each such

need—nAch, nAff, and nPow, respectively—will be used in this overview. The nAch is

defined as the need to do something that shows personal competence. The need for

affiliation refers to pleasing others and gaining their approval. And finally, the need for

power, nPow, refers to the need to have an impact on others (Reeve, 2009). As we will

see in self-determination theory, also, AMT theorists are expansive in their thinking

about needs. They posit that when these psychological needs are nurtured and satisfied,

human beings thrive and experience a sense of well-being. When needs are ignored or

otherwise thwarted, humans experience ill-being or decreased vitality (Reeve, 2009,

p. 172). Unlike SDT, however, AMT further hypothesizes that needs are experienced in

varying strengths—another example of individual differences.

In AMT, the social context, which includes anticipations of outcomes as

conceived in expectancy theory, is said to "trigger" behavior based on an individual's

unique configuration of needs (McClelland, 1987, p. 174). Based on a range of intensity,

one person's configuration of nAch, nAff, and, nPow would be different from another's, as would their responses to the environment's conditions. So, the three needs not only exist in each person with particular set points or default levels; individual behavioral responses to environmental triggers vary with changes in need intensity. In that way, AMT joins with expectancy theory to predict that valence would also vary. By accounting for such variance, AMT can address a range of responses to everyday work phenomena, including the pursuit of output goals (Locke & Latham, 2006). As will be shown in the instrumentation literature review, the three socialized needs in AMT are said to combine to engender a response of some intensity to engage in an activity, or say, strive to surpass a previous performance standard. That analysis dovetails with both our quotidian definition of achievement, and also the mandates inherent to work mentioned earlier. We can now turn to the fourth and final theory for inclusion in the instrument, self-determination theory (Deci & Ryan, 2000).

Self-Determination Theory

Self-determination theory (SDT) is the broadest of the motivation theories yet described. It is, in fact, a meta-theory that aims to describe general human functioning. There is nothing in SDT specifically intended to explain behavior specific to the work domain. It has, however, been validated in the work and organization domain (Gagné & Deci, 2005), as well as many others, such as sport and exercise (Adie et al., 2008), patient health (Williams, 2002), education and teaching (Reeve, 2002), parenting (Grolnick & Apostoleris, 2002), and environmentalism (Pelletier, 2002).

Self-determination theory continues the trend of social cognitive psychologists to elaborate explanations of what impels or inspires an individual to act within his or her environment. Self-determination theory proposes that people are naturally inclined to engage with and attempt increasing competence within their environments. This starting point sets SDT in opposition to reinforcement theory in that human functioning is said to be most positive when an individual acts voluntarily and optimistically and feels free of coercion or control by outside forces—such as the incentives and punishments emphasized in reinforcement theory (Deci & Ryan, 2000). Such subjective feelings of freedom result from optimal satisfaction of one's basic psychological needs of autonomy, relatedness, and competence.

Furthermore, SDT also explicates four forms of extrinsic motivation: external motivation, introjected motivation, identified motivation, and integrated motivation (Sheldon & Schachtman, 2007). External motivation is defined as acting based on an external inducement or reward. Introjected motivation refers to acting based on introjects, or feelings of guilt, shame, or fear, particularly with regard to important people and relationships. Identified motivation is characterized by action taken because the individual sees a meaningful relationship between the action and their personal goals. Integrated motivation is experienced when the action is deeply aligned with the individual's sense of self, or identity. Both the aligned and integrated forms of motivation are also characterized by not only a sense of engaging in activities freely, but also with sense of contribution to something beyond oneself (Gagné, 2003). This elaborated explanation that includes motivation type, quality, and both pro-self and pro-

social reasons for participating in an activity or domain is arguably SDT's most

significant contribution to motivation psychology. For decades prior to this point,

motivation researchers treated motivation as a unitary construct (Deci, 1992), focused on

its presence or absence, and when present, how much motivation was experienced. SDT,

by contrast, focuses not on the quantity of motivation, but rather on the *quality* of a

person's motivational experience (Deci & Ryan, 2000).

Taken together, the four forms of extrinsic motivation reveal the SDT proposition

that there are many different ways an individual can experience the environment. Some

of those ways are more positive than others. For example, an adult employee acting

based on the experience of introjected motivation has a less positive, less optimistic

experience than one whose motivation is of the integrated variety. Figure 1 expresses

this more fully; subjective well-being declines with distance from intrinsic motivation.
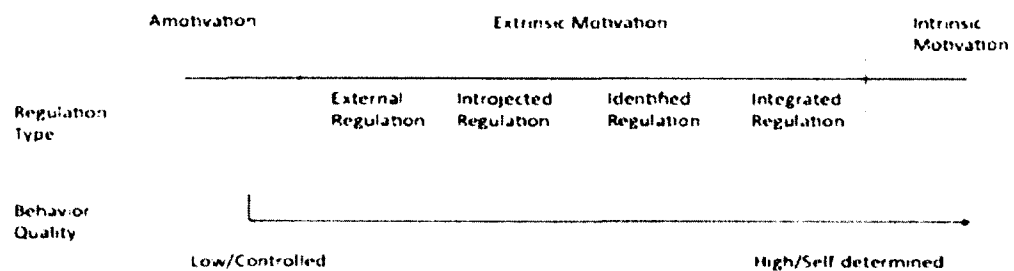
Figure 1. The self-determination continuum of motivation types. Adapted from *Handbook of Self-Determination Research* (p. 16) by E. L. Deci and R. M. Ryan, 2002. Rochester, NY: University of Rochester Press. Copyright 2007 by University of Rochester Press.

From that simplex pattern (Guttman, 1955)—which denotes the correlation of motivational types to each other by their placement along the continuum, with adjacent types more highly correlated than more distant types—intrinsic motivation is considered the pinnacle experience. But, on what bases are the subjective conclusions about well-being made? To answer that we turn very briefly to another set of theorized human needs: autonomy, relatedness, and competence.

The continuum in Figure 1 considers autonomy the fulcrum of the subjective well-being analysis. Autonomy is the degree of perceived freedom from external control or coercion. Autonomy as conceived in SDT is the antithesis of the lack of freedom individuals have when presented with an external incentive as in reinforcement theory. Autonomy is highest in the intrinsic motivation state and lowest with external motivation.

Relatedness is cousin to achievement motivation theory's need for affiliation. As in AMT, the SDT continuum allows for attempts at satisfying relatedness needs from a deficit-based avoidance of rejection. Like some formulations of AMT, SDT also allows for attempts to satisfy one's basic need for relatedness based on a healthier desire for commitment, intimacy, and vitality within relationships (Gaine & La Guardia, 2009). The difference between those two possibilities results in a different motivational experience or *type* on the continuum. Finally, competence is the desire to see oneself as efficacious within one's environment. It is similar to Bandura's (1997) concept of self-efficacy.

Self-determination theory arguably offers more explanatory power than any of the previous three theories. Its special contribution to motivation science is the proposition that intrinsic motivation is the highest quality motivational experience. This adds a new dimension to our overarching question, what do managers think motivates employees to act. Without including SDT in the instrument, we would not be able to get at the belief that employees are sometimes motivated because, or when, they truly enjoy what they do. It will now be useful to look at the instruments used to measure motivation within the four theoretical frameworks just discussed.

Motivation Instrumentation Literature

While manager beliefs about employee motivation have recently garnered heightened interest, and for more than 50 years organization researchers have said understanding such beliefs is important—not least because they influence the structure and content of organizational systems (McGregor, 2005)—I know of no instrument to investigate manager beliefs using several motivation theories. Since the purpose of this study is to create such an instrument, the following review of the instrumentation literature will provide an overview of the instruments for each theory that are widely cited and/or in current use. For sample items from several instruments and a first-attempt at the Motivation Beliefs Inventory correlates, see Appendix A. This instrumentation literature review covers each theory individually, after which the methodology used in this study is discussed.

Reinforcement Theory

Long ago, reinforcement theory was validated primarily using laboratory tests

with animals. Core reinforcement theory constructs such as positive response to rewards

and aversion to punishment inform a limited number of contemporary instruments such

as the Sensitivity to Reward and Sensitivity to Punishment Questionnaire for adults, the

SRSPQ (Torrubia, Avila, Molto, & Caseras, 2001), and a version for children, the

SRSPQ-C (Colder & O'Connor, 2004). Both instruments are based on Reinforcement

Sensitivity Theory (RST; Gray, 1970; Leue & Beauducel, 2008)—a personality theory

related to reinforcement theory. As reward and punishment are central to both RST and

reinforcement theory, both RST instruments informed the reinforcement theory construct

of the Motivation Beliefs Inventory.

As is also true of the instrumentation for each of the remaining theories in the

MBI, the SRSPQ instruments do not measure beliefs. Instead, the items measure an

adult's or child's susceptibility to reward and punishment, not one's beliefs about the

power of rewards and punishment to influence the behavior of oneself or others. For

instance, the adult is asked: "Do you often do things to be praised," and "Are you easily

discouraged in difficult situations" (Torrubia et al., 2001). Like the SRSPQ, the SRSPQ-

C items ask adults not about their motivation beliefs, but instead, they ask adults to rate

their child's behavior on a 5-point scale (Colder et al., 2011). Nor are the adults asked to

reveal their beliefs about the effectiveness of rewards and punishments for their children.

Sample items include "Your child engages in risky behavior to obtain a reward," and

"Your child often gives in to avoid a quarrel" (Colder & O'Connor, 2004).

Expectancy Valence Theory

The instrumentation situation for expectancy valence theory is similar to that of

reinforcement theory. While extensively studied since its initial formulation (e.g.,

Heneman & Schwab, 1972), most studies that used instruments to measure dimensions of

participants' expectancy-based motivation embedded the instruments or portions thereof

in broader methodologies. As such, the instruments were not treated as the primary way

to measure the links between the independent and outcome variables. A 1992 study by

Mathieu, Tannenbaum, and Salas provides an instructive example. In that field study, the

researchers used a Likert-type instrument to measure how individual motivation and

perceptions of situational variables influenced the effectiveness of a training program.

Participant motivation was measured in part by correlating a comparison of before-

program and after-program scores with knowledge gains (Mathieu et al., 1992, p. 834).

The motivation measure was adapted from a broader job satisfaction assessment, and the

new scale's statistical validity discussed. Unfortunately, few sample items were included

in the paper and the full, customized motivation scale was not published.

Matsui, Okada, and Mizuguchi (1981) took a similar approach in their

examination of the relationship between goal difficulty and performance. They used a

survey measure in a classroom experimental design study, but that survey was not

published. Other studies have examined the link between expectancy constructs and

activities central to organizational work, such as goal selection, the regulation of

attention, and the effort expended to achieve goals (Shah & Higgins, 1997). Others have

tested links between EVT constructs and job seeking behaviors (Feather & O'Brien,

1987). In each case, the authors described the instruments and confirmed their statistical validity but have not published the instruments or otherwise made them available.

Despite the fact that many instruments used within larger methodologies are not available, two instruments offer insights as to how expectancy motivation has been measured in the past: The Motivation Sources Inventory (Barbuto & Scholl, 1998) and the Valence, Instrumentality, Expectancy Motivation Scale (VIEMS; Sanchez, Truxillo, & Bauer, 2000). While instructive, the Motivation Sources Inventory (Barbuto & Scholl, 1998) presents limitations. It is not exclusively an EVT instrument, but it was validated using a sample of working professionals (Ryan, 2010). It also includes a useful, 6-item instrumentality subscale. The instrumentality subscale has demonstrated strong reliability (α = .80; Ryan, 2010, p 1573). Sample items that included implicit beliefs include, "When choosing jobs I usually choose the one that pays the most," and "I would work harder if I knew that my effort would lead to higher pay."

The more recent VIEMS is the most promising EVT theory instrument yet found. The VIEMS has good reliability and validity with alpha coefficients for all subscales (Henson, 2001) above .88. At 10 items, the instrument is parsimonious and available in its entirety (see Appendix A). Any calculation of the probability that a future outcome will result from current decisions or actions contains an implicit belief dimension. The VIEMS shows this in its instrumentality and expectancy items. For example, the instrumentality items include the statement, "I think you will be hired if you get the high test score." Similarly, the expectancy items include the statement: "If you concentrate and try hard, you can get a high test score."

The VIEMS includes another dimension that is related to beliefs. One such item reads, "I believe that I will get a good score on the test I took today." But while this item *is* about beliefs, it is not about the extent to which one person believes that others are motivated based on EVT principles.

Achievement Motivation Theory

Turning to the instrumentation for the third of the four theories included in the MBI, recall that AMT proposes three socialized needs for achievement (nAch), affiliation (nAff), and power (nPow). The few available AMT scales emphasize nAch, but exclude nAff and nPow. The nAch has been empirically linked to approach of success and avoidance of failure (Elliot & Church, 1997), goal achievement (Thrash & Hurst, 2008), goal achievement in terms of goal type—mastery or performance—and approach of success and avoidance of failure as in the Achievement Goal Questionnaire-Revised (AGC-R; Elliot & Murayama, 2008). Importantly, most such instruments focus on academic goal achievement. For example, Hermans (1970) created a 29-item scale focused entirely on nAch in high school students. Likewise, Elliot and Church (1997) focused their oft-cited 18-item instrument only on approach and avoidance goal achievement in school settings. While acceptable reliability was shown, the instruments only addressed the achievement aspects of AMT in education settings; they did not address nAff and nPow.

One study within the work domain focused on need for affiliation by exploring the link between need for achievement and the psychological contract between the organization and the employee (Lee & Liu, 2009, p. 323). While not purely an AMT

study, the study included a potentially useful 13-item relational subscale (Lee & Liu, 2009). Again, the larger instrument in which the relational subscale was embedded was not published. The psychological contract scale (Millward & Hopkins, 1998) from which Lee and Liu constructed their relational subscale items is available, but it only approximates need for affiliation, as the subscale is not about affiliation as AMT defines it—the scale is concerned with relational dimensions within the concept of reciprocity. Two such sample items are, "To me, working for this organization is like being a member of a family," and "I go out of my way for colleagues who I will call on at a later date to return the favor."

Perhaps the aforementioned instruments are evidence that generally speaking, survey instruments in the achievement motivation field have been notoriously problematic (Hermans, 1970). A primary reason is that achievement motivation research has preferred to measure motivation by the Thematic Apperception Test (TAT; Langan-Fox & Grant, 2006)—a sentence completion (Langan-Fox & Grant, 2007) and picture prompt response test. Participant prose and word phrase responses were then coded against all three AMT needs. The need for affiliation and need for power dimensions have been deemphasized in contemporary research studies and associated survey instruments. However, because AMT constructs of nAch, nAff, and nPow are germane to everyday manager-employee relationships and the structure of organizational systems, they are all relevant to the present effort to create and validate an instrument measuring beliefs using multiple theories.

Self-Determination Theory

Relative to RT, EVT, and AMT, the survey instrumentation landscape for SDT is lush. Instruments are employed and published in most studies. SDT research often examines dimensions of individual motivation on two levels, the global antecedents of one's motivational experience, and the quality of one's motivational experience within a context, often before and after an intervention. Important instruments in each area will now be discussed.

Personality factor scales. Global personality antecedents include general causality orientation and how personal behavior is regulated. Causality orientation is the degree to which the individual perceives himself or herself to be the origin and ongoing "manager" of his or her behavior and experience (Soenens, Berzonsky, Vansteenkiste, Beyers, & Goossens, 2005). It is common for several personality factors to be included in an extensive SDT study, but only the scale specifically created from within the SDT framework, the General Causality Orientation Scale (GCOS; Deci & Ryan, 1985a), will be discussed here. The scale asks for responses to single-sentence vignettes. An example of GCOS vignettes says, "Your company has promoted you to a position in a city far from your present location. As you think about the move you would probably . . . ." The vignettes offer three possible responses. Each response is given on a 7-point Likert-type scale. The scale is anchored with the lowest rating of "very unlikely" and the highest rating of "very likely." The midpoint option says, "moderately likely." There is also a 17-vignette (51-item) version. The answer options are based on level of interest, excitement or anxiety.

It is widely reported the GCOS has shown high correlations to a variety of other personality instruments and acceptable validity, with Cronbach alphas for the three subscales between .69 and .74. Recently, though, the control orientation subscale has shown lower reliability with an alpha of .59 (Lam & Gurland, 2008). Validity was tested using independent samples of students and employees. So while the GCOS is a beliefs instrument, it only measures beliefs that correspond to the instrument's three constructs, such as the extent to which an individual's general orientation to everyday situations is autonomous, controlled, or impersonal.

Domain scales. The second type of instrument widely used in SDT research measures an individual's motivation type, especially changes in type following an intervention. In these instruments, the effect of an intervention or activity is explained in terms of changes from one to another of six possible motivation types explicated by the theory. This category of instrument includes the Intrinsic Motivation Inventory (IMI; Ryan, 1982) and several domain scales, only some of which have been validated in organizational settings.

The following scales have demonstrated acceptable validity and reliability in non-organizational settings: the Academic Motivation Scale (AMS; Vallerand et al., 1992); two scales based on the AMS, the Research Motivation Scale (RMS; Deemer, Martens, & Buboltz, 2010) and the Leisure Motivation Scale (LMS; Kleiven, 2005); the Client Motivation for Therapy Scale (CMTS; Pelletier, Tuson, & Haddad, 1997); and the Sport Motivation Scale (Pelletier et al., 1995).

These domain scales (AMS, RMS, LMS, and CMTS) build on the IMI in that they attempt to measure an individual's motivation based on the types explicated by SDT, with questions customized to suit the domain. One item intended to assess an individual's level of intrinsic motivation in the CMTS, for example, reads, "For the pleasure I experience when I feel completely absorbed in a therapy session." A similar item for amotivation reads, "I had good reasons for going to therapy, however, now I wonder whether I should quit." The structure of such items stays constant across scales, with the particular context (here, therapy) changed to match the setting in which the instrument is deployed. This approach to item design—and the several constructs to which items correspond—is appropriate for an instrument that attempts to discern what type of motivation an individual experiences in a given context. As with the instruments employed to research motivation within the other three theoretical constructs, these SDT instruments measure actual motivation rather than beliefs about motivation.

Organizational domain scales. Two valid and reliable SDT instruments specifically created for the work domain are relevant to the MBI: the 18-item Work Extrinsic and Intrinsic Motivation Scale (WEIMS; Tremblay, Blanchard, Taylor, Pelletier, & Villeneuve, 2009); and the 12-item Motivation at Work Scale (MAWS; Gagné et al., 2010). Both instruments have been shown to be valid and reliable. These instruments are designed not only to validate SDT constructs in the work domain. They were specifically designed for the work domain. SDT, by contrast, is a general measure of motivation with primary instruments, such as the GCOS and the widely cited Intrinsic Motivation Inventory (Deci & Ryan, 1985b) were originally created to measure domain-

independent individual differences. The WEIMS and MAWS, on the other hand, were conceived as work motivation instruments based on SDT.

To further ensure relevance in the work domain, the predictive validity of the WEIMS was tested in relation to common workplace-specific experiences such as employee job satisfaction, commitment to the organization, perceptions of work climate characteristics such as the quality of feedback, recognition/encouragement, turnover intentions, and perceptions of organizational justice dimensions such as procedural fairness (Tremblay et al., 2009, p. 217). Similarly, the MAWS was correlated with antecedents and consequences (Gagné et al., 2010, p. 638) such as perceived organizational support, job satisfaction, and the various types of commitment: affective, normative, and continuance. While each of these workplace specific dimensions was measured at the individual level, they are also relevant to managers at an aggregate level. The construct validity of the MAWS has been established in two languages—English and French. Sample items from both instruments can be found in Appendix A.

Conclusion

In this chapter, the infrequent and whispered call to examine manager beliefs about motivation was traced through the motivation and organizational literatures. A review of motivation measurement methods revealed a dearth of instruments that assess beliefs about motivation. Instead, the vast majority of instruments measure an individual's motivational experience for a particular task, or in a particular domain such as work or school. The review of motivation measures along the lines of four major theories—reinforcement theory, expectancy valence theory, achievement motivation

theory, and self-determination theory—including related subconstructs sets the

foundation for the survey methodology explicated below. As a researcher, I know of no

empirical instruments designed to assess motivation beliefs in the manner undertaken

here.

CHAPTER THREE

METHODOLOGY

This chapter provides an overview of the steps taken to develop, test, and validate

the Motivation Beliefs Inventory. Information is provided about the process of

participant recruitment and selection, selection of subconstructs, item construction and

refinement, and the two phases of survey testing used to establish instrument validity and

reliability. Taken together, these steps provided the data used to answer the study's two

research questions.

Development of the Motivation Beliefs Inventory

Developing a survey instrument to answer the research question first required

identification and selection of relevant subconstructs within each theory. A

comprehensive review of the motivation literature revealed important dimensions of each

of the four theories to be tested for inclusion in the Motivation Beliefs Inventory

instrument. Appendix A shows several instruments historically used to measure

motivation in each theoretical tradition, and the subconstructs the instruments addressed.

However, because none of those instruments explicitly measures motivation beliefs at the

instrument or subscale level, no items or groups of items were used verbatim. Instead,

MBI items were generally based on the core precepts and subconstructs of each of the

four included theories. Table 1 shows the subconstructs of each theory included in the

item pools created for the tests one and two.

Table 1

Theories and subconstructs in the Motivation Beliefs Inventory

Theory	Construct
Reinforcement (RT)	Use of rewards and/or incentives
	Use of punishment
	Impact of rewards and/or incentives
	Impact of withholding rewards and/or punishment
Expectancy Valence (EVT)	Expectancy or probability of success
	Valence of outcomes
	Instrumentality of means to valued ends
	Commitment to means to valued ends
Achievement Motivation (AMT)	Socialized needs for achievement, affiliation, and power
	Striving to achieve something novel or record-breaking
	Challenge level of a goal
	Competing to win
Self-Determination (SDT)	Basic psychological needs for autonomy, relatedness, and competence that combine to form six motivational outlooks
	Impact of pressure on motivation
	Six motivational types: amotivation, external, introjected, identified, integrated, and intrinsic
	Contribution to welfare of the whole
	Integrated motivation and pro-social ends

Description of Validated Motivation Beliefs Inventory (MBI)

The 20-item Motivation Beliefs Inventory employs a 6-point Likert-type scale which allows respondents to report their level of agreement with each motivation belief statement using the following categories: Strongly disagree, somewhat disagree, disagree, agree, somewhat agree, strongly agree. In addition to the theory-based questions, the instrument also includes five demographic questions, which ask whether or not the participant manages people, their race/ethnicity, gender, education level, and birth year. The final instrument includes 20 statements, 5 for each of the four subscales.

Participants

Study participants were reached using the database of a global, management skills training company based in the western United States. The database included past and current buyers and consumers of the company's training and coaching services, as well as non-customers who have voluntarily agreed to be contacted. From a role standpoint, the database includes both managers and non-managers. The manager category includes anyone to whom another individual or group of individuals reports. From a title standpoint, the manager category includes positions such as supervisor, manager, and executive. The non-manager category refers to people with no direct reports.

Methods for Testing Validity and Reliability of the MBI Instrument

In an effort to answer the first research question—to what extent can a valid, reliable, brief, and multiple theory-based self-report instrument be created to measure a manager's beliefs about what motivates employees along four theoretical lines—two tests of the instrument were conducted to collect data from the participants described above, as

were several methods of data analysis. Prior to data collection, scholars with expertise in

the area of motivation vetted the items. The experts included three members of this

dissertation committee plus one motivation researcher from a European university. Items

were then adjusted, added, and eliminated. The refined instrument was then distributed

to the database of potential respondents.

Principal Components Analysis

Collected data were subjected to a principal components analysis (PCA) after

each of two tests. Principal components analysis allows for the separation and reduction

of a set of items into a smaller number of differentiated and uncorrelated clusters (Vogt,

2005). Individual items are said to "load on" a cluster based on how well they correlate

with each other but not with other items. The uncorrelated clusters—often called

factors—represent items that together correspond with a given psychological construct.

Principal component analysis, therefore, is both a means of data reduction (Hinkle,

Wiersma, & Jurs, 2003), and a means of establishing construct validity.

Central to PCA is the issue of data reduction, which is accomplished by

eliminating items from inclusion in the final instrument. The decision to eliminate items

is based on analysis of the individual item strength and intercorrelations—or

multicollinearity—between variables (Fink, 2003), both of which are indicated by

coefficient alphas. Item acceptability, then, was initially evaluated according to

coefficient alpha scores. Importantly, however, setting an alpha level on which decisions

about item retention or rejection are made is as much art as science (Meyers, Gamst, &

Guarino, 2006). Indeed, there are no emphatic standards for item alphas. Instead, there

are general guidelines offered by researchers (e.g., Clark & Watson, 1995; Cortina, 1993; Schmitt, 1996). Drawing on such research, a minimum acceptable individual item alpha was set at .50, though higher levels were preferred.

In PCA, the set of individual items is shown in a correlation matrix that displays the coefficient alpha for each item. The matrix also shows how items clustered together. In other words, the correlation matrix shows on which factors items "load." If an item loads on more than one factor, it is said to crossload. That is, in the minds of respondents the item may relate to more than one construct, or not relate to the construct it was written to represent. Naturally, it is hoped that individual items relate to only one factor, which in this case would be the theory it was originally written to represent. Because PCA shows how items relate to one another, and which relate to an insufficient number of other items, PCA helped not only coalesce the larger item pools into a smaller number of factors, it also helped verify which items loaded on which factors. For example, an item that was initially predicted to correspond to only one of the four theories—AMT, for instance—might have also correlated too highly with self-determination theory. In such a case, the item would be eliminated because it did not successfully differentiate a dimension of AMT from a dimension of SDT. Based on its many advantages for data reduction and refinement, therefore, PCA was ideal for answering the first research question.

Principal component analysis and other statistical tests were conducted using Statistical Package for Social Sciences (SPSS) software, version 19. The question of how many factors to retain in a PCA analysis is among the most important decisions facing

researchers (Hayton, Allen, & Scarpello, 2004). In an effort to answer that question for the MBI, maximize inferential robustness, and more pointedly, to simultaneously minimize the inferential risks associated with the standard eigenvalue >1 decision rule for factor extraction (Costello & Osborne, 2005), a secondary check on the factor structure indicated by PCA—parallel analysis—was also conducted.

Parallel Analysis

Parallel analysis (PA) helps researchers decide on the maximum number of factors to extract from the data based on the scree test (Crawford et al., 2010). Parallel analysis has been shown to be one of the most accurate methods of determining the number of latent factors indicated by the data. In fact, parallel analysis has been shown to be a more reliable method for choosing the number of factors to retain than using only a numerical analysis of eigenvalue greater than 1 rule (Reise, Waller, & Comrey, 2000). More specifically, PA was used in Test Two to determine if four factors, one for each motivation theory, could reasonably be extracted from the data. Because it offers a heightened level of scrutiny of the factor structure indicated by PCA, PA helped enabled a more confident and positive answer to the first research question.

More specifically, parallel analysis is based on the standard scree test. The standard scree analysis produces a line graph of eigenvalues wherein the elbow in the curve indicates the acceptable number of factors to extract; the number of data points above the inflection point is the suggested number of factors to retain (Field, 2009). In the case of components or factors, an eigenvalue usually represents the amount of variance accounted for by a group of items. Each individual item is assumed to have an

eigenvalue of one. Since a component or factor is a group of related items, the higher the eigenvalue for the factor the stronger it is said to be. In other words, the more variance the factor explains. Factors that have eigenvalues less than one are said to explain less variance than would a single item, hence the eigenvalue greater than one rule for factor retention. In a standard scree test, factors with eigenvalues greater than one are said to be inferentially robust enough to be retained; the higher the eigenvalue the better.

Oftentimes, however, identifying a clear inflection point in the scree plot is difficult (Ferguson & Cox, 1993). Parallel analysis is used to clarify the number of factors to retain. Therefore, while parallel analysis is based on standard scree analysis, parallel analysis allows for an added level of scrutiny of the factor structure than is possible when examining only standard scree plot generated by the original dataset. Parallel analysis generates a researcher-selected number of randomly generated eigenvalues—up to several thousand— based on the characteristics of the dataset, such as the sample size and number of variables (Ferguson & Cox, 1993, p. 89). These additional values are averaged. The resulting means are plotted on the original scree plot. The point at which the two lines intersect is the cut off point for factor retention; similar to the standard scree plot, the number of points above the point of intersection indicates the number of factors to extract (Hayton et al., 2004).

Factor Reliability

After data were collected from participants in both tests and the item set was further refined based on principal component—and parallel analyses after Test Two—a Cronbach alpha (Cronbach, 1951) calculation was performed to determine the inferential

robustness of each set of clustered questions—or each component. Cronbach alpha is a

measure of how well a number of items together represent a given construct (McGrath,

2005), and is often reported on both item and factor levels. At the factor level, an alpha

coefficient indicates the internal consistency of a set of related items. Often called

reliability, internal consistency is the ability of the subscale to produce similar statistical

results with different sample groups (DeVellis, 2003). Despite some debate (Bernardi,

1994), it is generally accepted that an alpha score of .70 is the lower limit of

acceptability, though scores approaching .80 are preferred (Nunnally, 1978). While alpha

scores can range from zero to one, .70 was set as the internal consistency requirement for

each factor in the Motivation Beliefs Inventory. For the total instrument, an alpha

coefficient of .80 was the target.

Discriminant Validity

Once it appeared a final set of items from each test had coalesced into subscales

with acceptable psychometric properties, the subscales were tested for discriminant

validity. Discriminant validity acts as a negative check of whether an instrument

measures what it says it measures by making sure it does *not* measure a construct from

which it is hypothesized to be theoretically distinct (Anastasi, 1976). In other words, the

subscales—and the total instrument—should not measure what it is not intended to

measure. As a means of validating the ability to differentiate psychological constructs, it

is generally accepted that no subscale of the proposed instrument should correlate with

any subscale of the comparison instrument at a level greater than .85 (Campbell, 1960).

The .85 criterion was used to test the discriminant validity of the MBI subscales.

Answering the Second Research Question

After the validity and reliability of MBI subscales, and the total instrument were established, two analyses were used to attempt to answer the second research question. The first was an analysis of differences between group means using analysis of variance, or ANOVA. Analysis of variance helps determine if there is a statistically significant difference in the mean scores between groups on the same item or subscale (Cohen, 2003b). Groups analyzed in this study were manager and non-manager, male and female, white/Caucasian and non-white. Additionally, as with the first research question and the use of parallel analysis, a second level of scrutiny—power analysis (Cohen, 2003a)—was applied. Power analysis analyzes differences between means given their standard deviations, the sample size of both groups, and the chosen confidence interval. The power analysis statistic, called Cohen's d, is a standardized measure of the difference between means—or, better still, the groups from which the means were generated—and describes the long-term likelihood that the null hypothesis—which states that no difference between the groups exists—can be rejected. While Cohen's d is often used to report differences between group means in experimental design studies that include a control group and one or more groups that received an intervention, here it was used to gauge the magnitude of statistically relevant differences between independent groups of survey respondents.

Procedures

After receiving approval from the University of San Diego Institutional Review Board, the first version of the MBI was prepared for distribution. A total of 28 and 42

items were included in the Tests One and Two, respectively. Test Two included 16 items retained after data reduction from Test One plus 24 new items. The new items were added in an attempt to improve upon subscale alpha statistics obtained from Test One. For both tests, a previously validated 16-item scale, the Beliefs About Well-Being Scale (BWBS), was included to establish discriminant validity. Five additional items asked for demographic data.

For the first and second tests, respectively, the instrument was distributed to approximately 60,000 and 40,000 names drawn randomly from a database approximately 90,000 names. The instrument was distributed using Qualtrics software. After each test, the data were uploaded into SPSS software for analysis. Each dataset was then verified for accuracy of transfer and adjusted for missing data. Data reduction and refinement after the first test were completed using principal components analysis. For the second test, both PCA and parallel analysis were used. In both tests, reliability of each of the four subscales was then analyzed using Cronbach alpha (Cronbach, 1951), and discriminant validity established. After the second test, data were ultimately reduced to 20 items. This item set formed the completed MBI and provided the basis for answering the study's research questions.

Establishing Discriminant Validity

Before concluding this chapter, it may help to briefly elaborate the appropriateness of using the BWBS to establish discriminant validity of the MBI. The BWBS was relevant for several reasons. The first is that, like the MBI, the BWBS examines beliefs across four subconstructs, such as the experience of pleasure, the

avoidance of negative experience, development of the self, and contributing to others (McMahan & Estes, 2010, p. 267). Furthermore, like the concept of motivation, the concept of well-being is relatable to everyday experience. More importantly, though, well-being—and its BWBS subconstructs—are often anecdotally related to motivation. It is common for individuals, for example, to talk about their motivation in terms of "how thing are going generally." It is also common in everyday life to define one's sense of psychological well-being in the moment in terms of one's affect, or the presence or absence of negative emotions, situations, or issues. At work, too, it is common for people to question whether the small tasks they perform are really helping them develop new skills, or if such tasks contribute to something bigger or more meaningful—two of the four dimensions of well-being validated in the BWBS.

From a scientific standpoint, too, the construct of subjective well-being is relevant because it is associated with—and yet distinct from—motivation. Self-determination theory, for example, proposes that one's subjective well-being results from the extent to which one's innate psychological needs for autonomy, relatedness, and competence are satisfied (Deci & Ryan, 2000). Furthermore, SDT proposes that the more intrinsically motivated an individual is—or the extent to which they naturally enjoy the activity in which they engage—the greater their sense of vitality and well-being. The relationship of well-being to motivation is relevant beyond SDT, however. Indeed, Vroom (1995) said that were he to conceptualize expectancy-valence theory today—or at least decades after his original presentation of the theory—he would include intrinsic motivation as conceived by SDT researchers—which includes the dimension of subjective well-being.

As such, Vroom, sees well-being as related not only to self-determination concepts of motivation, but also to the expectancy valence dimensions of motivation.

Like the many instruments discussed in the literature review, the BWBS and its individual items are not about motivation beliefs as conceptualized in the MBI. Nonetheless, because the BWBS explores beliefs that are close to but distinct from motivation as proposed in the MBI, the BWBS helped demonstrate that the MBI captures motivation beliefs across several theoretical frameworks without conflating beliefs with a conceptually related, yet distinct, set of beliefs about one's personal and general sense of well-being. Finally, the BWBS conceptualizes subjective well-being as having four subconstructs. They are the experience of pleasure (EP), absence of negative affect (ANE), self-development (SD), and contribution to others (CO).

Conclusion

This chapter provided an overview of the several steps taken to develop, test, and validate the psychometric properties of the Motivation Beliefs Inventory. A review of the literature confirmed that the methodology chosen uses accepted standards for motivation instruments. As such, I believe the process outlined in this chapter provided a sufficient level of rigor upon which to base the assertions that the MBI is a statistically valid, reliable, parsimonious, inferentially robust, and practitioner-friendly new offering to the motivation literature. The next chapter will discuss the results of the many tests to which the data were subjected, and upon which such assertions about reliability and validity were based.

CHAPTER FOUR

RESULTS

This chapter details the validity and reliability statistics from field testing the

Motivation Beliefs Inventory. More specifically, this chapter describes participant

recruitment, instrument delivery, sample characteristics, data processing and analysis,

and the several steps taken to establish the validity and verify the reliability of the final

20-item MBI via principal component analysis, parallel analysis, and the test of

discriminant validity. This chapter ends with an initial response to research question two

by examining the differences between group means, and three important effect sizes

(Cohen, 2003a).

Participants and Instrument Delivery

Two versions of the MBI were distributed to the database of a global,

management skills training company based in the western United States. The two

versions comprised Tests One and Two, respectively, and, as such, were distributed three

months apart. From a total database of approximately 90,000 names, the instrument was

distributed to randomly drawn sample of 60,000 in Test One, and 40,000 names in Test

Two. The database includes both managers and non-managers in a variety of countries

who have interfaced with the organization in some way, including non-clients, and both

purchasers of and participants in the organization's programs. The largest possible

distributions were attempted in both Tests One and Two. While it is possible, though,

that some respondents from Test Two also participated in Test One, it is assumed

participants self-selected not to participate twice. The smaller participant sample size

achieved in Test Two may corroborate this assumption. Indeed, from those large pools of

potential participants, samples of 1,322 and 712 were achieved for Test One and Test

Two, respectively. In the first test, no adjustments were made for missing data. For Test

Two, approximately 605 completed surveys were returned; however, another 107

partially completed surveys were adjusted for missing data, the method for which will be

discussed later.

Test One was conducted in July 2011. Test Two was conducted in October 2011.

Study participants received an email invitation to the survey. The email briefly explained

the purpose of the survey, offered instructions for participation, and provided an

electronic link that opened the survey. All surveys were completed electronically.

Standard human subject disclosures were also included. In addition to distribution of the

MBI by this researcher, it is known that some recipients forwarded the survey to

colleagues and other business professionals known either personally or through their

work. The number of additional participants obtained from such secondary distributions

is thought to be negligible.

Sample Characteristics

Fully completed instruments were received from 1,322 participants in Test One.

Another several hundred were partially completed. Based on an analysis of the number

of completed instruments received to the number of items in the instrument, it was

decided to drop partially completed surveys from analysis. More specifically, because

the number of completed instruments resulted in a sample size to item (SSIR) ratio—a

measure of sample adequacy commonly used in factor analytic research— at the upper

end of the range generally considered acceptable (Costello & Osborne, 2005), no

imputation of missing data was necessary for partially completed surveys. While the

SSIR is far from a firm standard (Velicer & Faya, 1998) according to a recent literature

review of more than 300 exploratory factor analytic studies (Costello & Osborne, 2005),

only 21% achieved a sample size to item ratio greater or equal to 20:1. As there were 28

items in Test One, a SSIR of 47:1 was achieved. The SSIR dropped in the second test to

17:1 due to an increased item set and a smaller final sample size. In Test Two, 605

completed instruments were returned. To achieve a higher SSIR ratio, and thus

maximize inferential robustness, another 107 were adjusted for minimal amounts of

missing data, resulting in a total of sample size of 712. Despite the SSIR decrease in Test

Two to 17:1, the ratio was still greater than the ratios reported in nearly two thirds of the

studies reviewed by Costello and Osborne (2005). Information about missing data is

offered below in the section on sample size adequacy.

Sample Size Adequacy

It cannot be overstated that sample size selection is a crucial consideration in

psychometric research (Guadagnoli & Velicer, 1988). Indeed, the strength of inferences

drawn from sample data and made about the wider population are substantially related to

the size of the sample. While the sample size question has no definitive answer (Hinkle

& Oliver, 1983), in addition to the SSIR guideline, another general rule for principal

components analysis is that larger sample sizes are preferred. Simply put, large samples

are predicted to result in better estimates of the population parameters. In this study,

sample size adequacy was evaluated against the rating scale of Comrey and Lee

(MacCallum, Widaman, Zhang, & Hong, 1999). In that scale, a sample size of 100 was

rated poor, 200 was rated fair, 300 was considered good, 500 very good, and 1,000

excellent. In the first and second tests, respectively, sample sizes of 1,322 and 712 were

achieved resulting in excellent to very good samples upon which to base validity,

reliability, and between-group inferences for the Motivation Beliefs Inventory.

Sample Demographics

The demographics for respondents in both Tests One and Two were similar. In

Test One, of the 1,322 respondents, 966 were managers (73%) and 356 were non-

managers. Forty-one percent were male, and 59% were female. The vast majority of

respondents—80%—were white/Caucasian. From an education standpoint, 266

respondents had completed high school or some college, while 497 had achieved an

undergraduate degree and 559 (42%) held graduate degrees. Despite the smaller sample

size, the demographic breakdowns for respondents in Test Two are similar to those of

Test One. Of the 712 respondents, 73% were managers, 44% were male, 85% were

white/Caucasian, and 44% held graduate degrees. See Appendix B for full demographic

data for both Test One and Test Two.

<div align="center">

Data Preparation

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Despite that the achieved sample sizes met generally accepted standards, it was

still necessary to subject the data returned by participants to additional levels of scrutiny.

These additional steps helped determine to what extent the data was appropriate for

principal components analysis. The first additional step was to evaluate the KMO

statistic. The Kaiser-Meyer-Olkin (KMO) test is an accepted standard for scrutinizing

sampling adequacy. Like the poor to excellent scale used for sample size adequacy, the KMO score is also given in a range from poor to excellent—or in the words of one of its principal researchers, from unacceptable to marvelous (Dziuban & Shirkey, 1974). More specifically, in a range from zero to one, below .50 is unacceptable, figures in the .50s are considered miserable, .60s is considered mediocre, .70s is called acceptable, .80s is considered meritorious, and .90s is lauded as marvelous. The desired level for the KMO statistic for this study—.80—was exceeded in both Tests One and Two (.83 and .81, respectively).

The second level of scrutiny applied to the sample was Bartlett's Test of Sphericity (Field, 2009), which helps ensure the underlying data were not shown to have unequal variances—as if they drawn from different samples. In a case of sphericity, the variables would not correlate sufficiently to make principal component analysis appropriate (Field, 2009, p. 648)—or, at a minimum, would make any inferences based on the data spurious. This is logical given that in this study, an a priori assumption was made that some variables, by virtue of their shared variance, would cluster into groups because they represent distinct yet related aspects of a single motivation theory. In order for them to cluster more readily, imagine they all exist in a bubble together within reasonable distances from each other. Zero or minimal shared variance—or distance— would render such clustering unlikely or impossible. Instead, some clustering is desired. Bartlett's statistic ranges between zero (sufficient clustering) and one, with figures very close to zero preferred. For this study, the Bartlett's statistics were acceptable and significant at .01 for both Tests One and Two.

The third and final level of added scrutiny of the Test Two dataset relates to missing data. As mentioned earlier, given what Comrey and Lee-rated excellent sample size (as cited in MacCallum et al., 1999) of 1,322 in Test One, incomplete responses were dropped. In Test Two, however, the sample returned 605 completed surveys. Approximately 107 more had minimal missing data. To improve the SSIR, achieve a sample size large enough to maximize statistical significance, and also to make the discovery of effect sizes more likely (Ellis, 2010), the decision was made to impute values for the missing data.

Missing data is one of the most common challenges researchers face regardless of the methods they choose. While the methods for handling missing data continually evolve, two unbiased methods in survey research were used: Listwise deletion and mean substitution (Acock, 2005). Listwise deletion is considered both rigorous and highly conservative method for handling missing data primarily because it drops all data in a case if a single item or question was not answered. The obvious impact is a reduction of sample size. In the second test, 605 completed surveys were returned. Another 107 contained a small amount of missing data. The MBI instrument was finally validated using 712 cases, so had the final sample size for the second test remained at 605, the negative impact on sample size of listwise deletion would have been a reduction of 15%. Despite the smaller sample of 605 cases, the sample size still would have qualified as very good according to Comrey and Lee (as cited in MacCallum, 1999). Appendix B provides demographic data for both Test One and Test Two. Of note, there were no demographic changes as a result of data imputation.

The second unbiased method used to address missing data is mean substitution. Using mean substitution, the arithmetic mean for an individual variable is calculated from the completed surveys and imputted into the cases in which respondents left that item or question blank. This method resulted in an increase in sample size from 605 to 712.

Data in this second test were analyzed using both methods for handling missing data with no material effects on the results; the items still loaded on the same factors, and the KMO statistic remained in the range of .82—or in the meritorious range described earlier (Dziuban & Shirkey, 1974). There was also no impact on the Bartlett's sphericity score, which remained significant at .01. A final check of the factor structure and reliabilities using each missing data method was performed with, again, negligible impact on either the factors identified via PCA, or the reliability of each factor and the four final factors together. There was also negligible impact on item reliability scores.

Data Analysis

Separate principal components analyses were conducted for Tests One and Two. In Test One, analysis was conducted on completed instruments returned by 1,322 participants. In both tests, participants were asked to rate their agreement with each belief statement on a 6 point Likert-type scale from strongly disagree to strongly agree. In Test One, 28 items were presented to participants (Appendix C) along with the five demographic questions regarding gender, work role, ethnicity, birth year, and education level. In Test Two, 42 theory items were presented to respondents (Appendix D) with the same demographic questions. In Test Two, a principal component analysis was conducted on data from 712 returned surveys, 107 of which included values replaced by

mean substitution. Forty-two items were included in Test Two, plus the same five

demographic questions used in Test One. Henceforth the first and second tests of the

Motivation Beliefs Inventory will be referred to as Test One principal component

analysis and Test Two principal component analysis, respectively.

Test One Principal Components Analysis

Using SPSS software version 19, the first step was to determine sampling

adequacy using the KMO score Bartlett's test for sphericity. Indeed, both statistics

determined that principal component analysis was appropriate for this dataset. The KMO

score for the entire dataset of 28 variables was in the meritorious range (Dziuban &

Shirkey, 1974) at .87. Bartlett's sphericity score is optimal when it is both statistically

significant at or very close to zero; for this data set its value was significant at a level of

.01. The SPSS software was set to extract factors based on eigenvalues greater than one,

using Varimax rotation, and a maximum of 50 rotations. The resulting factor structure

for all 28 items, however, was inadequate as several items crossloaded at unacceptable

levels on multiple factors. However, based on analysis of item alphas and the resulting

Cronbach alpha scores for the four, four-item factors they formed, 16 items were retained

and carried into Test Two.

Item Retention and Elimination

In keeping with best practice, the 16 retained items were chosen through an

iterative process of elimination (Clark & Watson, 1995). Items that crossloaded on more

than one factor at a similar and high alpha level were eliminated, as those items did not

sufficiently differentiate between dimensions of multiple theories—and clearly did not

distinguish a dimension of the single theory for which the items were originally written.

Individual item alpha scores are a measure of item reliability, and help answer the

question, "Does this item clearly and reliably relate to a single construct?" While

crossloading is not ideal, it is often a reality, particularly when dimensions of constructs

one is attempting to differentiate—in this case, whole motivation theories—are

conceptually similar (Ferguson & Cox, 1993). The test for retaining an item that

crossloads on multiple factors, then, is determined by whether it correlated more strongly

with one factor than the others (Clark & Watson, 1995). No universal decision rules

about the optimal magnitude of the difference between strong and relatively weaker

loadings have been agreed upon by researchers, though Ferguson and Cox (1993) suggest

a differential of $\geq .20$. Even with such a guideline, however, researchers must exercise

their best judgment—judgment that may well be based not only on the coefficient alpha

scores, but also on the conceptual dimensions of the item and the subscales on which it

loads (Ferguson & Cox, 1993, p. 91). In other words, from a psychological construct

standpoint, does it legitimately "belong" with the items in the factor on which it more

strongly loaded? If yes, that item is an excellent candidate for retention. Even if it loaded

more weakly on a second factor that contains items with which it aligns better

conceptually, it is still a candidate for deletion (Clark & Watson, 1995, p. 317). In this

study, this dilemma presented itself only insofar as a small number of items crossloaded

at acceptably lower levels on a second factor. Conceptually, however, those items were

strongly related to the factors on which they loaded highest, a point that will be

elaborated in Chapter 5. This point will arise again in the discussion of the PCA results

from Test Two. As a general rule for both Tests One and Two, the reliability coefficient goal to retain items was set at .50, with a target differential for any crossloading on multiple factors of $\geq$ .20.

Component Matrix and Variance Explained

The results of the principal component analysis for Test One yielded four factors with four items per factor. Table 2 shows the factor loads for the rotated component matrix. Sampling adequacy was rechecked and revealed both a KMO score for this reduced number of items of .81. The Bartlett's Test of Sphericity was significant at .01. In three of the factors, items loaded at a level of .60 or higher. The fourth factor items loaded between .51 and .72. Note that two of the 16 items crossloaded on a second factor, but did so very near or above the .20 threshold compared to the primary factor on which they loaded. These crossloadings were deemed low enough to retain the items for inclusion in Test Two. Table 3 shows the eigenvalues and variance statistics for each of the four factors, including the amount of variance explained.

The Varimax rotation method reported here is arguably the most common rotation method used in psychometric research (Costello & Osborne, 2005), and it is commonly asserted that different rotation methods did not produce strikingly different results. Nonetheless, to ensure the factor structure did not depend upon the selection of rotation method, the data was also subjected to an oblique rotation method. No notable differences in item alpha levels or in factor loadings resulted from the change of rotation method.

Table 2

Rotated component matrix including factor loads per variable in Test One

Item	Component			
	1	2	3	4
RT1	.80			
RT2	.79			
RT3	.70			
RT7	.72			
EVT10		.56		.31
EVT12		.77		
EVT13		.72		
EVT14		.54		.35
AMT15			.69	
AMT17			.67	
AMT19			.60	
AMT21			.64	
SDT22				.53
SDT23				.64
SDT25				.51
SDT26				.72

Note. Rotated component matrix. Rotation method: Varimax. Rotation converged in 5 iterations.

Table 3

Factor eigenvalues greater than one in Test One

Factor Number	Eigenvalue	% of Variance	Cumulative % of Variance
1	3.33	20.83	20.83
2	2.37	14.78	35.60
3	1.25	7.83	43.43
4	1.03	6.44	49.88

Test Two Principal Components Analysis

A principal components analysis was conducted in Test Two using methods similar to those used for Test One, with some noteworthy exceptions. In order to

improve the psychometric properties of the instrument, it was necessary to expand the item set in Test Two beyond the 16 items retained from Test One. The 26 new items added in Test Two brought the total number of items included in Test Two version of the instrument to 42. In addition to the expansion of the item pool, three extra statistical methods were also used to further verify the statistical strength of what would become the final, 20-item Motivation Beliefs Inventory: parallel analysis; effect size analysis; and discriminant validity analysis. The Test Two process of analysis is described below. See Appendix D for the 16 items retained from Test One, and also the full item pool for Test Two.

The second version of the MBI instrument was distributed to approximately 40,000 names drawn randomly from the 90,000-name database of a global management skills training company in the western United States. The number of completed surveys returned was 605. Another 107 were partially completed. Of the 107 partially completed surveys, there were 100 missing values in the 42 items related to the four motivation theories. Twenty-nine data were missing in the RT items. Twenty-seven were missing in the EVT items, 24 in the AMT items, and 20 in the SDT items. Thirty-two data were missing from the among the discriminant validity responses. There were no missing data in the demographic items. Missing values were imputed using mean substitution. From a sample size adequacy standpoint, the sample size achieved ($n = 712$) is considered very good for principal component analysis (MacCallum et al., 1999).

In addition to sample size adequacy, two additional checks were employed to ensure the sample was appropriate for principal component analysis. The KMO score for

this sample achieved a slightly stronger—and still rated "great"—score (Hutcheson &

Sofroniou, 1999) of .83, relative to the KMO score achieved in Test One (.81). Bartlett's

Test of Sphericity further confirmed this data set was appropriate for principal component

analysis, returning a significant score of .01.

Having established the appropriateness of principal component analysis for this

dataset, PCA revealed a parsimonious four-component structure from an initial pool of 42

items in Test Two. Each resulting component contained five items. Table 4 shows the

rotated component matrix. Notably, only three items loaded at the low end of the range

for all items of .53 to .83. Most items loaded on their primary factors at a level of .70 or

higher, which is well above the minimum single-item factor loading standard of .40

recommended by Stevens (as cited in Field, 2009, pp. 644-645).

The eigenvalues for the four factors are indicated in Table 5. Individual factor

eigenvalues improved from a range of 1.03 to 3.33 in Test One to a range of 1.50 to

4.39 in Test Two. In Test Two, the total variance explained improved by approximately

10%.

As stated earlier, as it was hoped that Test Two would result in an instrument that

met the standards sought in research question one—that the instrument delineate four

factors with each representing one of four motivation theories; that the instrument contain

a parsimonious item-set; and also that each factor and the total instrument demonstrate

statistically significant validity and reliability. In an effort to answer the first of those

standards, an additional level of scrutiny—parallel analysis—was applied to the dataset.

Figure 2 shows that parallel analysis confirmed the four-factor structure was appropriate

for this dataset. Recall that the number of points above the point of intersection is the number of factors to extract from the data. In this case, the four factor structure indicated by both the correlation matrix and the eigenvalue table was confirmed by parallel analysis.

Table 4

Rotated component matrix including factor loads per variable in Test Two

Item	Component			
	1	2	3	4
AMT28	.74			
AMT29	.78			
AMT30	.73			
AMT33	.75			
AMT34	.75			
RT1		.83		
RT2		.81		
RT3		.72		
RT4		.66		
RT19		.60		
EVT6			.76	
EVT7			.79	
EVT8			.69	
EVT26			.57	
EVT27			.54	
SDT16	.38			.53
SDT37				.73
SDT38				.77
SDT39				.75
SDT40	.35			.63

Note. Rotated component matrix. Rotation method: Varimax. Rotation converged in 5 iterations.

Table 5

Factor eigenvalues greater than one in Test Two

| Factor	Eigenvalue	% of Variance	Cumulative % of Variance
(1) AMT	4.39	21.93	21.93
(2) RT	2.94	14.69	36.62
(3) SDT	2.12	10.57	47.19
(4) EVT	1.50	7.51	54.70
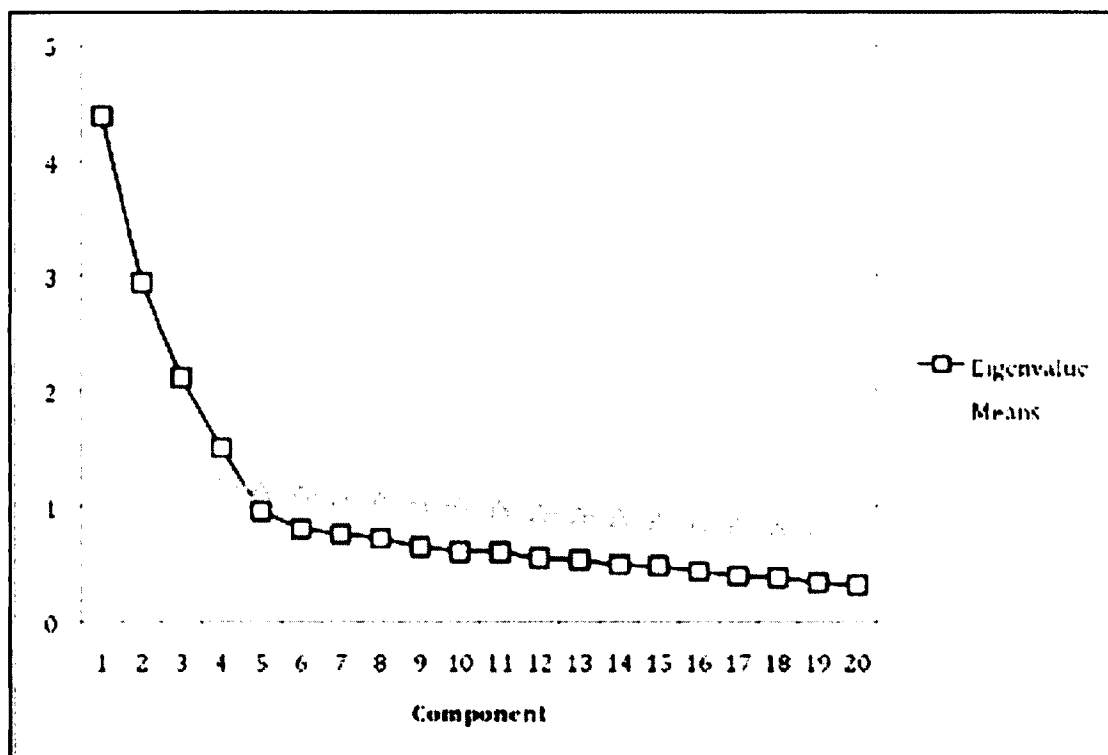
Figure 2. Parallel analysis scree plot.

Once a four-factor structure was established within the group of 20 questions comprising the MBI, the reliability of each factor was analyzed. Subscale means, standard deviations, and alpha coefficients are shown in Table 6. The internal consistency of each subscale as measured by Cronbach alphas for all subscales was

acceptable. The alphas for the AMT, RT, and SDT subscales showed high internal consistency, at .82, .77, and .77, respectively. The EVT subscale demonstrated an acceptable level of .71.

Table 6

Descriptive statistics by subscale for Tests One and Two

Subscale	Test One (n = 1,322)				Test Two (n = 712)			
	Subscale M[a]	Item M[a]	Subscale SD[a]	α^a	Subscale M[b]	Item M[b]	Subscale SD[b]	α^b
(1) AMT	18.33	4.58	2.42	.62	50.58	4.11	3.75	.82
(2) RT	12.31	3.08	3.57	.74	16.48	3.30	4.23	.77
(3) SDT	20.04	5.01	2.12	.53	24.94	4.99	2.85	.77
(4) EVT	19.09	4.77	2.36	.63	23.93	4.79	2.84	.71

[a]Four items per subscale. [b]Five items per subscale.

An additional check of the construct validity of the instrument based on subscale correlations was performed, the statistics for which can also be found in Table 7. The correlations between subscales were at acceptably low levels. Of note, the correlation between SDT and AMT was highest at .45 of all subscale correlations. The correlation between the RT and SDT subscales was low and in the anticipated negative direction. This latter finding lends credibility to the construct validity of the instrument as prior SDT research has consistently shown (e.g., Deci et al., 2001; Roth & Assor, 2010; Williams et al., 2006) negative correlations between external rewards, contingent incentives, and pressure and control, and intrinsic motivation. All such correlations were significant at the .01 level or better.

Table 7

Cronbach alpha coefficients and subscale correlations in final Motivation Beliefs Inventory

Item	Theory			
	AMT	RT	SDT	EVT
amt28	.74			
amt29	.78			
amt30	.73			
amt33	.75			
amt34	.75			
rt1		.83		
rt2		.81		
rt3		.72		
rt4		.66		
rt19		.60		
evt6			.53	
evt7			.73	
evt8			.77	
evt26			.75	
evt27			.63	
sdt16	.38			.76
sdt37				.79
sdt38				.69
sdt39				.57
sdt40	.35			.54
MBI-AMT	1.00			
MBI-RT	.11	1.00		
MBI-SDT	.45	-.10	1.00	
MBI-EVT	.26	.16	.32	1.00

Discriminant Validity

After establishing the construct validity of the MBI via principal components and

parallel analyses, the instrument was tested for discriminant validity. Discriminant

validity scrutinizes whether an instrument measures what it attempts to measure by

making sure it does *not* measure—or diverges from—what it is not trying to measure. In

both Tests One and Two, a set of items was included in the MBI to establish that the MBI

measured beliefs about motivation and not another set of beliefs. The Beliefs About

Well-being Scale (BWBS; McMahan & Estes, 2010) was used to establish discriminant

validity. The advantages of the BWBS scale are several, including that it has

demonstrated acceptable psychometric properties, is available in its entirety, is current,

and is about beliefs.

Table 8 shows the correlations between MBI subscales and the four subscales of

the BWBS. Of note, only one MBI subscale correlates at an unacceptably high level with

a subscale of the BWBS. Discriminant validity correlation levels, which range between

zero and one, are said to be acceptable in the range below .85 (Campbell & Fiske, 1959).

Discriminant validity was established for the MBI insofar as all but one subscale

correlation remained well below Campbell and Fiske's threshold, which offers evidence

of discriminant validity.

Table 8

Discriminant validity correlates with BWBS subscales in Study Two (n = 712)

	MBI Subscale			
	AMT	RT	SDT	EVT
Experience of Pleasure	.15	.40	.12	.15
Avoidance of Negative Experience	.40	.24	.49	.70
Self-Development	.34	.10	.58	.97
Contribution to Others	.33	.36	.35	.54

Responding to Research Question Two

Having established the validity and reliability of the MBI instrument, attention

turned to an analysis of the data provided by groups within the sample of 712 participants

in Test Two. Recall participants were asked to provide demographic information such as their gender, whether they managed other people, the level of education attained, and their race/ethnicity. Of Test Two respondents, approximately 44% were male; 56% were female. From a role standpoint, 73% managed people in some capacity as a supervisor, manager, or executive. Participants represented several racial/ethnic groups, however, as the participants were overwhelmingly white/Caucasian (85%), analysis along lines of race/ethnicity was deemed inappropriate for this sample. From an education standpoint, approximately 14% had some college or an associate degree, 39% held bachelor degrees, 39% held master degrees, and 5% held doctoral degrees.

Subscale-Level Differences in Test Two

At the aggregate level, in terms of belief intensity by theory or factor, data from Test Two respondents showed self-determination beliefs were most strongly held ($M = 24.94$) followed by EVT ($M = 23.93$) and AMT ($M = 20.58$). Reinforcement theory beliefs were least strongly rated with a lower mean of 16.48.

Demographic analysis is a precursor to the analysis of differences between groups. In this study, the analysis of differences between subgroups was performed to discern what, if any, demographic characteristics correspond with beliefs about motivation. The first area in which group differences were statistically significant was in reinforcement theory and achievement theory beliefs among males and females. The differences were analyzed using independent sample t tests. The mean on the RT subscale for males and females was 3.39 and 3.22, respectively, at significance level $p < .01$, t (2.58). Similarly, the statistics for mean differences for males and females for the

AMT subscale (4.20 vs. 4.05, t (2.78), $p < .01$) were also significant. The only other area of a significant difference between group means was between the manager and non-manager on the SDT subscale (4.95 vs. 5.08, t (-2.60), $p < .01$).

Item-Level Group Differences in Test Two

To explore those group differences in finer detail, an item-level analysis was performed, also using independent sample t tests. Indeed, males and females produced significant mean differences on items (Appendix E) RT2 ($p < .01$) and RT4 ($p < .01$) in the RT subscale, and four items in the AMT subscale: AMT28 ($p < .05$, AMT29 ($p < .05$), AMT33 ($p < .01$) and AMT34 ($p < .05$). For managers and non-managers on the SDT subscale, the items of statistically significant difference were SDT37 ($p < .01$), SDT38 ($p < .05$) and SDT40 ($p < .01$). The RT items refer to the effectiveness of rewards and/or punishment as an effective means of regulating employee focus and behavior. Three of the four AMT items refer to the effectiveness of goals—in particular challenging goals—to stimulate individual striving and maximum effort. The fourth AMT item (AMT34) refers to the greater salience for the employee of striving in order to achieve something novel rather than to receive external compensation or a reward. The primary theoretical subconstructs represented by the three SDT items that showed meaningful between-group differences are employees engaging due to personal interests and values (SDT37), motivation maximization as a function of alignment of individual and organizational interests and goals (SDT38) and, finally, personal growth being more important for one's motivational outlook than is being competent at the task or goal being performed (SDT40).

Effect Sizes

While it is typical to end the analysis of group differences after reporting

statistical significance of such differences, an additional level of analysis was performed

to discern what if any of those statistically meaningful differences could be said to have

practical meaning (Schmidt, 2003). Effect size is to practical meaning as p values are to

statistical meaning (Ellis, 2010). In other words, the effect size measure—Cohen's d—is

intended to help discern the power or strength of a difference; the means between groups

might be different in statistically relevant terms, but how big is the difference in practical

terms? In text here, effect sizes are reported at the subscale level. Table 9 shows the

effect sizes at both the subscale level, and for the individual items with statistically

significant between group mean differences, as noted earlier. More specifically, the

effect sizes related to male and female beliefs about reinforcement and achievement

theories were .20 and .21, respectively. Similarly, the effect size for the differences

between means of manager and non-manager responses on the SDT subscale was -.22.

The negative effect size indicates that the mean for the second group, in this case non-

managers, was larger than for the first group, managers. Thus, non-managers rated their

SDT beliefs more highly than did managers.

While the point estimate of effect size is meaningful, more important is the

confidence interval associated with each estimate (Ellis, 2010). The confidence interval

shown in Table 9 can be interpreted by saying this researcher is 95% confident the true

effect size for each subscale and the associated items falls within the estimated interval.

Of note, while the point estimates stated above are small, also note the upper end of the

confidence interval is also small. Nonetheless, an effect size in the range between .20

and .30 is said to be "educationally significant" (Wolf, 1986). Caution against

overstating even an educationally significant effect size is appropriate, however—

particularly from a single study. Indeed, the lower end of the effect size range shown for

most reported effect sizes says there is no meaningful difference in means for the

associated groups.

Table 9

Cohen's d statistic for significant mean differences at subscale and item levels in Test

Two

		Cohen's *d* Statistic		
Theory Subscale	Test Two Item Number	Male/Female Comparison	Manager/Non-Manager Comparison	95% Confidence Interval
AMT		.20*		.10 < d < .27
	AMT28	.15		.05 < d < .25
	AMT29	.17		.07 < d < .26
	AMT33	.20		.10 < d < .28
	AMT34	.16		.05 < d < .27
RT		.21*		.13 < d < .28
	RT2	.25		.12 < d < .37
	RT4	.23		.10 < d < .34
SDT			-.22*	-.27 < d < -.14
	SDT37		-.31	-.38 < d < -.21
	SDT38		-.17	-.23 < d < -.08
	SDT40		-.24	-.31 < d < -.12

$p < .01$.

Construct Analysis of Retained and Eliminated Items

Test One

Recall that the 16 items retained from Test One coalesced into four, four-item

components with reasonable, but insufficient, psychometric properties. While each factor

represented one of the four pre-selected theories, as anticipated, each set of retained items was checked to determine if they were heterogeneous enough in the subconstructs they represented. In other words, since high internal consistency can be achieved by writing items that are conceptually similar—or identical—despite semantic differences (Henson, 2001), this analysis was important to ensure the reduced item pool did not represent an unacceptably narrow set of dimensions of their underlying theories. The following analysis will briefly cover important aspects of how each theory's subconstructs were operationalized in items in tests one and two. It is important to remember, however, that no instruments identified in the review of literature against which MBI items might be compared measured beliefs. As a result, the following analysis offers primarily a construct or thematic analysis, rather than a subscale-to-subscale or item-to-item comparison.

Reinforcement theory. Representing multiple constructs in the item set was easier for reinforcement theory than for the other three theories, mainly because there are fewer of them, and they are relatively simple. The main constructs identified from the review of theory and instrumentation literature (e.g., Colder & O'Connor, 2004) pertain to use of rewards, punishment, and incentives. Three of the four reinforcement theory items retained from Test One relate to how effectively and reliably incentives control and focus employee behavior. The fourth item refers to punishment's effectiveness to eliminate unwanted behavior. Taken together, the four retained items (RT1, RT2, RT3 and RT7; Appendix D) were deemed heterogeneous enough for inclusion in Test Two. Indeed, of the 16 items retained for the four subscales from Test One (four items each),

these four RT subscale items were the only complete set of subscale items to be included in the final instrument (see Appendix E).

Of the three eliminated items, most interesting is item RT4. The item said, "It is important to be consistent in what behavior gets rewarded." While eliminated in Test One, the theme of consistent use of reinforcements is so central to reinforcement theory that a reworded, but similar item was included in Test Two. Indeed, the new item relating to consistency of rewards—RT19— successfully factored in Test Two, and is part of the reinforcement theory factor in the final MBI (see Appendix E).

Expectancy valence theory. The four items retained after Test One (EVT10, EVT12, EVT13, and EVT14; Appendix D) relate to core aspects of EVT identified from the literature, particularly how the anticipated probability of achieving a desired outcome affects both initial engagement and the amount of effort expended in pursuit of the outcome. While no items were specifically about beliefs as in the MBI, recall the primary EVT dimensions operationalized in the VIEMS instrument (Sanchez et al., 2000) were valence, instrumentality, expectancy, and perceived performance. The four retained items from Test One relate to the instrumentality and expectancy constructs. More specifically, the retained items relate to the central assumption of EVT theory that people tend to chose goals they predict will maximum preferred outcomes (Tubbs, Boehne, & Dahl, 1993) while items related to valence—or the emotional desirability, attractiveness, and anticipated satisfaction of a particular outcome (Van Eerde & Thierry, 1996)—were eliminated based on insufficient statistical strength. That items related to a core dimension of a theory did not show adequate statistical properties was not unique to

EVT, however. The same issue was seen with the AMT and SDT constructs, and so will be discussed again in a later section of this chapter. It will also be discussed in the limitations and general discussion in Chapter 5.

Achievement motivation theory. The four items retained in the AMT subscale (AMT15, AMT17, AMT19, and AMT21; Appendix D) from Test One correspond to core aspects of theory emphasized in the literature insofar as they relate to the three socialized needs for achievement, affiliation, and power. A careful reading of items AMT15, AMT17, and AMT19 reveals nuanced variations on those themes. Item AMT15 is about the general belief that employees strive to accomplish goals as a means to meeting their three personal needs. Item AMT17 is about the belief that one's motivation is based on one's individual needs for achievement, positive relationships, and to be influential—all variations on the nAch, nAff, and nPow subconstructs. Item AMT21 says one believes that one engages and persists in projects based on their three human needs for achievement, affiliation, and power. The remaining item, AMT19, referred to only the need for affiliation as defined as the need to gain approval or please others. Taken together, the four retained AMT items refer to the three needs. As with the other three subscales, the AMT subscale alpha in Test One did not rise to acceptable levels, and thereby required that new items be added. One significant advantage of the expanded item set was that more dimensions of AMT theory could be included.

The items eliminated after Test One represented a broader set of theoretical subconstructs from the literature and prior AMT instruments than did the final Test One subscale of four items. While none of the prior AMT instruments were about beliefs as

conceptualized in the MBI, it is as important to briefly explore the items that factored

poorly enough as to require elimination, as it is to examine the set of retained items. One

such eliminated item attempted to focus on the need for power just like AMT19

attempted to focus on the need for affiliation. Another eliminated item referred to the

belief that individual motivation is based on one's need to compete against a performance

standard—a variation on the nAch construct (Thrash & Hurst, 2008). The third

eliminated item dealt with the core AMT theory and instrumentation construct of

approaching success and avoiding failure (Elliot & Church, 1997), and its influence on

how one attempts to achieve goals. Based on analysis of the Test One AMT subscale,

additional items were added to achieve acceptable metrics. The new AMT items allowed

previously unrepresented aspects of AMT to be included. Examples include striving to

accomplish something novel, reaching or exceeding a performance standard, competing

with others to win, and the degree of challenge presented by a goal.

Self-determination theory. As a meta-theory, self-determination theory is

arguably the broadest of the four theories included in the Motivation Beliefs Inventory.

While a scale of related, yet heterogeneous items is the ultimate goal of principal

component analysis, it is inherently difficult to represent all dimensions of theory in a

short set of items (Bernstein & Teng, 1989). Nonetheless, the four items retained from

Test One (SDT22, SDT23, SDT24, and SDT26) represent core dimensions of SDT, such

the influence of personal interest, task enjoyment, and a sense of autonomy on one's

inclination to engage or remain engaged in an activity (Deci & Ryan, 2000). The fourth

item represented a dimension of SDT dealing with a pro-social motivational stance such as that characterized by the integrated motivational outlook (Gagné, 2003).

The three items eliminated after Test One also related to core dimensions of SDT, such as the negative impact of promised rewards on individual motivation (SDT28). Others include that one can still experience high quality motivation despite not enjoying a task as long as the person believes the task is personally meaningful and is aligned with personal values (Deci & Ryan, 1985b). Also eliminated was an item addressing the belief that employees have an inherent need to be competent at what they do (SDT25). The latter such item referred to one of the three basic psychological needs hypothesized by SDT, competence (Reeve & Sickenius, 1994).

Test Two

While the findings from Test One provided initial empirical evidence for a four-factor survey instrument of motivation beliefs based on four theories, the substandard statistics for the 16 retained items mandated the addition of new items for each factor. In an effort to achieve a parsimonious and valid instrument that both contained a heterogeneous set of items (Henson, 2001) and that met statistical standards, the 16 retained items were augmented with new items that either reintroduced an essential eliminated tenet in a different way—as with item RT19—or introduced previously unrepresented subconstructs. Appendix D shows the 42 items included in Test Two of the MBI, 26 of which were added after Test One. Five items were added for reinforcement theory, six for EVT, seven for AMT, and eight new items were added to the SDT subscale.

Reinforcement theory. The new reinforcement theory items again referred to beliefs about the impact or power of reward and punishment incentives to alter behavior and motivation, but with added nuance. Item RT20 referred to another core RT tenet that offering an incentive is a good way to catalyze behavior for something the subject does not naturally enjoy. Item RT21 referred to the belief that offering an incentive is the best way to get an employee to change behavior by doing something else. Item RT17 took a different approach to the punishment construct by stating a belief that "withholding rewards is an effective way to eliminate unwanted behavior." Finally, given its primacy in RT, a new item (RT19) referring to consistent use of rewards (Skinner, 1974) was added in Test Two despite that a similar item had been eliminated after Test One. Of the new items, RT19 was retained in the final version of the MBI (see Appendix E).

Expectancy valence theory. The new items added in Test Two for EVT also allowed for previously unrepresented aspects of the theory, while some restated aspects that had not factored sufficiently in Test One to be retained (see Appendix D). For example, item EVT22 referred to the amount of effort one would expend when the possible outcome of their effort was valued. Item EVT24 also referred to amount of motivation or effort but in relation to goals, rather than "outcomes." Item EVT27 refers to the belief that one's motivation is at its peak when one believes the effort will be worth it by producing good results. A core dimension of EVT is the link between expectancy and effort, so it was explored via several items. Whereas Test One items referred to the expectancy-effort link in terms of high expectation and high effort, item EVT26 took

another approach by referring to the link in terms of low expectation and low effort.

Both EVT26 and EVT27 were retained in the final MBI (see Appendix E).

Achievement motivation theory. While most of the AMT items retained from

Test One dealt with the three socialized needs for achievement, affiliation, and power, the

items added in Test Two referred to additional theoretical dimensions, including aspects

of the link between goal difficulty and individual striving (Elliot & Church, 1997).

Examples include items AMT28, AMT29, and AMT33. Three items referred to the

belief that beating a previous performance standard, or accomplishing something novel is

naturally motivating. And finally, one item dealt with the belief that accomplishing

something novel is more motivating than receiving a reward for having accomplished it.

Items AMT33 and AMT34 were retained in the final version of the MBI.

Self-determination theory. Since the Test One SDT subscale had the lowest

alpha of the four subscales (.53), more items were added in Test Two for SDT than for

the other three theories—eight in all. One of the eight new items (SDT36) referred to the

belief that two particular forms of external pressure common in the workplace and

frequently discussed in the SDT literature (e.g., Baard et al., 2004; Deci, Koestner, &

Ryan, 1999) undermine an employee's desire to engage in work they naturally enjoy.

The SDT literature also shows that many SDT intervention and instrument validation

studies do not attempt to research the integrated motivational outlook, despite that it is

one of the six theorized motivational experiences. Furthermore, integrated motivation—

the most pro-social form theorized by SDT (Deci & Ryan, 2000)—is also said to be the

most self-determined of the motivational experiences theorized by self-determination

theory (Ryan & Deci, 2011). Item SDT35 referred to pro-social reasons for doing one's

work (Grant, 2008). Nonetheless, item SDT35 did not factor sufficiently well to be

retained. The SDT concept of integrated, pro-social motivation is, however, represented

in the final MBI instrument by item SDT16 (its Test Two moniker), one of the items

retained from Test One.

The SDT items for Test Two also attempted to more fully represent theorized

motivational states in which the individual has internalized external regulations, values,

and goal meaning by aligning them with their personal interests, goals, and values

(Sheldon & Ryan, 2011). Such concepts were operationalized in items SDT37 and

SDT38, both of which are present in the final MBI (see Appendix E).

CHAPTER FIVE

DISCUSSION

The results of the two tests of the Motivation Beliefs Inventory offer evidence for

the conceptual and statistical validity and reliability of the final instrument. In this

concluding chapter, I will discuss important aspects of the process used to create and

validate the MBI. An initial interpretation of intriguing data from two tests will be

explored, including that several constructs considered by researchers to be theoretically

distinct were not viewed as such by participants. The discussion will then turn to

implications of the MBI and studies like this one for research and organizational practice.

The limitations of this study will also be discussed.

Theoretical Basis

This study addresses the need for a tool to help scholars and business practitioners

better understand the content of managers'—and more broadly, employees'—beliefs

about motivation. A review of the motivation and organization literatures revealed that

motivation beliefs remain little explored by motivation and organizational scholars. Most

motivation studies have measured some aspect of an individual's actual motivational

experience, such as strength or type, using a single theoretical framework. Historically,

the few studies that have investigated motivation beliefs focused on ranking preset lists of

motives such as organizational and job factors that individuals value at differing levels of

importance (Kovach, 1987). Examples include interesting work, job security, and good

wages. Between-group differences were then reported. Such studies, however, did not

then analyze the results based on one or more motivation theories to attempt to illuminate aspects of a framework of motivation beliefs held by respondents.

Though few in number, notable studies about motivation beliefs (e.g., Heath, 1999; Pelletier & Vallerand, 1996) show that individuals consistently state others are motivated by extrinsic factors—such as compensation and status—more than intrinsic factors—such as doing meaningful work and behaving altruistically (Heath, 1999). Such studies show that the beliefs authority figures—such as teachers and managers—hold about those in lower positions—such as students and employees—influence not only the behavior the authority figures use, but also the responses they then receive. Responses tend to confirm the initial motivation beliefs. Indeed, Heath's study is particularly important as it proposed that individuals hold lay theories of motivation which include an extrinsic incentive bias—the belief that others are motivated primarily by external incentives and rewards. The effect of, say, a manager holding such a lay theory is that the manager will align his or her behavior toward employees so as to emphasize external—and particularly contingent—incentives and rewards. In that case, the manager will orient his or her behavior and that of others around the beliefs of one, possibly two theories: reinforcement and expectancy valence theories. The employee receiving such behavior may, however, have different or more elaborate beliefs about motivation, which would remain unexplored and unengaged. The result of such a manager-employee dynamic would be a motivational system based on the preference for and assumed positive utility of contingent reward, contingent regard, external incentives, and even punishment, and a belief that individual performance is contingent on expectancy

calculations. While such beliefs studies offer important insights for leadership practice within organizations, they are rare; the vast majority of motivation research continues to measure an individual's actual motivation level in a single life domain and context using a single theoretical framework.

Organizational scholars, however, had often addressed beliefs. For years, organizational researchers postulated that approaches to management, and the structure and content of organizational systems are based on beliefs managers hold about human beings, and about the fundamental purposes of business (McGregor, 2005). While they have not addressed motivation beliefs or how they combine in lay theories, organizational researchers have discussed the impact of mental models in terms of how they influence the structure of organizations and facilitate or thwart organizational change efforts (Senge, 1990). Because motivation researchers had focused on measuring motivation but rarely motivation beliefs, and organizational researchers had focused on beliefs but not motivation, this research study was conceived.

Having established a conceptual basis for this study, two research questions were formulated. The first asked, to what extent can a valid, reliable, brief survey instrument be developed to measure motivation beliefs held by managers using four motivation theories—reinforcement theory, expectancy valence theory, achievement motivation theory, and self-determination theory? The second research question asked what are some of the initial findings by participant demographic group?

Answering Research Questions One and Two

Research Question One

The Motivation Beliefs Inventory was created and validated using principal

component analysis with data from two large samples of businesspeople drawn from the

database of a U.S.-based international leadership training company. The findings from

two separate tests conducted several months apart indicate that the MBI contains four

factors, with each factor representing a single motivation theory. The final instrument

contains 20 items, five per theory (Appendix D). The four subscale structure was

revealed using principal component analysis. Each factor demonstrated acceptable

eigenvalues (Reise et al., 2000), and the four-factor structure was verified using parallel

analysis. The final structure demonstrated acceptable internal consistency with subscale

alpha coefficients ranging from .71 to .82. The Cronbach alpha for the entire instrument

is .77, indicating an acceptable and moderately high degree of reliability.

While the majority of items loaded only on the factor representing the theory for

which they were written, two SDT items crossloaded at low levels on the AMT factor. A

conservative threshold for suppressing crossloading statistics was set for this study. In

much construct validity research, however, no crossloadings are reported in the

component matrix of retained items. Had a less conservative suppression threshold been

set the factor structure of the MBI component matrix, too, would be pristine. However,

because it may be theoretically meaningful (Ferguson & Cox, 1993), it was decided to

retain the crossloading items, and report the crossloading statistics for items SDT16 and

SDT40. Doing so may reveal an important conceptual overlap (Ferguson & Cox, p. 91),

and thereby serve the ultimate purpose of the MBI—to help reveal the content and

structure of individual beliefs about motivation.

The spirit of this study is focused on helping individuals better understand the

motivation beliefs they use to manage their own experience and guide the attention and

actions of others at work. As such, that two SDT items crossloaded on the AMT factor

may be meaningful, if statistically unfortunate. Individuals are said to combine

motivation beliefs into lay theories (Heath, 1999), yet little is known about lay theory

content or how such beliefs are structured. It may be that motivation beliefs related to a

single theoretical framework are not so easily separated in the minds of participants.

Perhaps that is the case with the two SDT items that crossloaded on the AMT factor.

While distinct theories, SDT and AMT both include hypotheses about needs; SDT deals

with basic psychological needs native to the human experience. Achievement motivation

theory deals with socialized needs. On that basis, crossloading of an SDT needs item

with that of AMT might be anticipated. Curiously, though, neither of the crossloading

SDT items refers to needs. These two items were, however, presented with other SDT

items that in different ways dealt with the needs for competence and autonomy, but only

one such item used the word need—item AMT29 from Test Two (Appendix D). Such

conceptual overlap may be a reasonable inference given the correlation between AMT

and SDT subscales of .45. While not high, it was the highest of all MBI subscale

correlations. To avoid speculation, however, perhaps no more can—or ought—be

inferred than more research into such crossloading items is needed. Such research may

help researchers, organizational consultants, and leaders positively influence individual

motivation, and the content and structure of organizational systems to more fully respond to employees' socialized *and* basic psychological needs.

Similarly intriguing results will be discussed later and will lead to suggestions for future research. These two crossloadings notwithstanding, the results of this study indicate that the instrument successfully factored motivation beliefs using a brief set of items reflecting core constructs of four theories. This result provides a positive response to the first research question.

Research Question Two

Having successfully validated the instrument, attention turned to answering the second research question, which asked, what were some of the initial results returned by respondents? The first finding relates to belief strength among all participants in Test Two. The Motivation Beliefs Inventory allows respondents to rate their agreement with motivation beliefs related to four theories. Agreement is measured using a 6-point Likert-type scale with options for strongly disagree, disagree, somewhat disagree, somewhat agree, agree, and strongly agree, with strongly agree valued at six. As such, the instrument measures belief strength. Data indicate SDT beliefs were most strongly agreed with, followed very closely by those for EVT, and AMT. Reinforcement theory beliefs were the least strongly held, and at a considerable differential. This finding is important because it may indicate that despite that RT principles are embedded in organizational systems—and also readily vocalized in everyday conversations about the reasons employees would or would not begin or continue a particular task, goal, or project—employees actually hold different, even contradictory, beliefs more strongly.

This finding may be particularly interesting to SDT researchers who frequently discuss

the negative effects of RT-based behaviors and systems on individual motivation and

well-being (Deci et al., 1999).

That expectancy-valence theory beliefs were agreed at almost the same high level

as those of SDT was not predicted. Such a finding is unsurprising, however, especially

since EVT is arguably the most prevalent process theory of motivation (Vroom, 1995).

Certainly, expectancy calculations are a central part of management decision making, in

which the allocation of today's resources, including individual effort, is strongly related

to predictions about the likelihood those resources will produce desired outcomes.

Again in the spirit of gleaning additional insight into the content and structure of

individual motivation beliefs, a deeper analysis is warranted. The data show the mean

scores by subscale for SDT, EVT, and AMT are statistically similar. However, the mean

for the RT subscale mean (16.48) is approximately 1.3 standard deviations lower than

that of the mean for all subscales combined ($M = 21.48$, $SD = 3.82$). These findings are

important when viewed with prior research. The assertions by Pink in his 2009 best

seller, *Drive*, highlighted the gap between the reality of organizational systems predicated

on reinforcement theory tenets and the antithetical assertions of SDT. Additionally, from

anecdotal experience, I can report Pink's assertions—based almost entirely on SDT

research—that prevailing ideas about motivation are rooted in outdated and conceptually

narrow theory, and that such beliefs form the basis for organizational systems, have

stimulated fresh thinking about motivation by organizational consultants and human

resources/organizational development executives. Practitioners are inviting more

conversations about the limitations and unintended consequences of what Pink and SDT

scholars often call traditional approaches to employee motivation—most notably those

rooted in RT.

It may be tempting to interpret the large difference between RT and SDT means

as unequivocal evidence that respondents prefer the more humanistic tenets of SDT to the

behavioristic tenets of reinforcement theory. From a statistical standpoint, RT beliefs

were clearly rated less strongly than those of SDT. Given that more than half of Test

Two respondents were managers, the gap may inspire optimism that making practical use

of the humanistic SDT assertions in "the real world" is possible. However, there are

myriad possible interpretations to temper premature conclusions. For example, perhaps

the managers in the sample do not work at sufficiently high job levels in the

organizational hierarchy to influence managerial systems or policies. Perhaps this

instrument reveals espoused rather than enacted beliefs. Participants may have agreed

with SDT beliefs more strongly, but it cannot be known whether they believe they can,

actually do, or wish to act upon such beliefs.

Reinforcement theory and SDT are not the only respondent beliefs that inspired

deeper analysis. The means for the EVT and SDT subscales did, also. Expectancy

valence theory predicates motivation on beliefs about the likelihood of achieving a valued

outcome (Vroom, 1995). That notion is contained in SDT in its concept of

instrumentality (Gagné & Deci, 2005), but the more strongly the belief is held, the less

intrinsic, or optimal, an individual's motivational experience is said to be. How is it that

EVT and SDT subscale means were similar, given the theoretical distinctions between

EVT and SDT? One possible answer is that the more expansive a theory, the more difficult it may be to represent all its dimensions in a short survey instrument. This is part of the challenge of balancing parsimony so that an instrument can be easily administered, and expansive content so as to maximally represent important constructs (DeVellis, 2003). For example, if items representing the most antithetical—or even most similar—aspects of two or more theories were eliminated based on insufficient alpha coefficients or unacceptable crossloading, the validated survey might not represent either the full range of conceptual differences or similarities of included theories—and yet the entire instrument may still be valid and reliable. A second interpretation is that beliefs that are separable theoretically and statistically may not be separable components of the lay theories individuals have formed about motivation at work. These findings and questions are a subject for future research, but first, consider other interesting findings generated while validating the Motivation Beliefs Inventory.

Consider between group differences, for example. Using Cohen's effect size analysis (Cohen, 2003a), three primary between group differences were identified. Males agreed with AMT beliefs more strongly than did females. Males also agreed with RT beliefs more strongly than did females. Another between-group difference was found with managers and non-managers, with non-managers agreeing more strongly with SDT beliefs than did managers. In all three cases the size of the difference is small, according to Cohen's standards. Since the *d* statistic is a standardized measure of standard deviation, the effect sizes found in this study—approximately .20—equate to differences of one fifth of one standard deviation. Nonetheless, despite the small differences, it was

deemed important to explore effect size differences to avoid overstating the practical

significance of statistically significant mean differences (Ellis, 2010).

What these differences mean practically, however, can only be inferred, and ought

to only be inferred carefully. Bearing in mind the literature review returned no

instruments specifically related to motivation beliefs aside from the Kovach (1987)

method for ranking motives, it is not possible to examine the between group differences

related to RT and AMT beliefs by gender found in this study with similar results in prior

motivation research. Based on data from this study alone, it would be difficult to avoid

speculation about the RT finding that males agreed slightly more strongly with RT beliefs

than did females; likewise with AMT. Given the many individual, environmental, or

social factors that influence experienced achievement motivation (Ruble, 1980), care is

needed in recognizing that the effect size found between males and females in this study

is small and only a morsel of data about achievement motivation beliefs. In fact, even in

light of significant studies about gender and achievement motivation (e.g., Farmer, 1985),

for decades achievement motivation researchers have sternly warned against gender

based analyses, as they often lead to dubious inferences (Stewart & Chester, 1982). Very

recently, Pinder (2008) remarked, "there is no reason to conclude that either the need [for

achievement] or its arousal . . . is different among men and women" (p. 79). Such

caution related to measured achievement motivation. More research is needed before any

inferences about the gender-based beliefs differences found in this study ought to be

drawn.

A reasonable inference about the manager/non-manager effect size for the SDT

set of beliefs may be possible, though. In a notable SDT study (Gagné et al., 2010) in the

work and organization domain, differences in experienced motivation by individuals in

different roles were reported. The four role categories were technical/manual,

sales/service, health/education, and management/professional (Gagné et al., 2010,

p. 639). The data show that employees at "lower" levels in the organization—

categorized as technical/manual—experienced lower quality motivation and less intrinsic

motivation than did employees in the management/professional category.

In SDT research, motivation experienced by workers in different roles and levels

in the organization—similar to the distinction between managers and non-managers in

the Motivation Beliefs Inventory—is explained based on a dimension of SDT related to

the extent the individual's basic psychological needs were satisfied; the greater the

satisfaction level, the greater their experience of intrinsic motivation. While it is a

nuanced clarification, that study and others showing between-group differences would be

unlikely to link experienced motivation directly to a role or position differential such as

manager/non-manager. Instead, any experienced motivation differences reported by role

would be inferred from the level of basic need satisfaction experienced differentially at

each level. Some reasonable conclusions might be made then about—in SDT parlance—

managers having more autonomy and so experiencing greater intrinsic motivation. In

this study, however, non-managers agreed with the SDT beliefs slightly more strongly

than did managers. This is a curious result if higher level employees generally

experience more intrinsic motivation. This small effect size finding may reveal a gap

between the motivation a person experiences themselves and what they believe about

motivation generally. Additional studies may elaborate these ideas more fully.

The foregoing discussion about intriguing findings refers to items and factors

present in the final instrument. The following analysis explores more deeply items and

factors that were discarded due to insufficient statistical strength. This analysis may be

untraditional, but it may also be interesting, if not useful, to researchers sharing the

ultimate purpose of this study—to shed more light onto the little unexplored terrain of

motivation beliefs.

Beneath the Numbers: A Deeper Look into Discarded Items and Factors

Based on analysis of published research, the content of this section is unusual.

Few, if any, studies discuss discarded items and factors in any depth. But, at the risk of

overstating it, the ultimate purpose of this study—and the valid instrument that resulted

from it—was to help researchers and practitioners better understand individual

motivation beliefs. The final MBI instrument is intended to help researchers and

practitioners achieve this purpose. Analysis of discarded items and factors may also

serve this purpose. Upon that rationale I offer the following analysis, steeped in curiosity

and replete with rhetorical questions that invite future research.

The process of successfully aligning the tenets of four motivation theories into

four distinct components or factors provoked fresh thinking about how motivation beliefs

are held by study participants. For example, creating the valid and reliable MBI survey

instrument required analyzing data at both the item and factor levels. Individual MBI

items were created to represent beliefs about aspects of a single theory, and those items

often clustered into factors with conceptually related items. While crossloading of items in a principal component analysis is not ideal, it is often a reality, particularly when subconstructs within larger theories one is attempting to differentiate are conceptually similar (Ferguson & Cox, 1993). A common statistical response to this construct-related issue is to suppress or ignore crossloadings below .40 (Field, 2009). However, because motivation beliefs had not been studied in the manner of this study, a more conservative suppression threshold of .30 was used. An advantage of the more conservative threshold is the potential to glean some insight as to where motivation beliefs were potentially inseparable in the minds of participants. Recall that in the final instrument, two items crossloaded on another factor above the .30 suppression threshold, items SDT16 and SDT40. Both items loaded much more strongly on the SDT factor, as was intended; nonetheless, both also crossloaded on the AMT factor at a level high enough to inspire this discussion. Customarily such low crossloadings are ignored. Perhaps, any factors formed by items from multiple theories could also be ignored. Perhaps the data represent nothing more than type one error (Hayton et al., 2004); there may be no effect despite what the data appear to show.

Statistical standards also allow for discarding factors with alphas in the .60 range, and those that contain items from several theoretically distinct constructs—though there is some evidence this practice may leave potentially important findings undiscovered (Bernardi, 1994). It is further justified to discard such items and factors given that the purpose of the Motivation Beliefs Inventory—to create an instrument that separates four theoretically distinct sets of motivation beliefs; a factor that includes items representing

multiple theories, therefore, warrants rejection. But, ignoring such items and factors

entirely might also undermine this study's practical aim—to help researchers and

practitioners understand the content of manager and employee beliefs about motivation.

Data from Test One offer an instructive example. A set of seven items

representing three of the four included theories formed a factor with a surprisingly high

alpha coefficient of .66—only slightly lower than the alpha for all seven EVT items (α =

.69), and notably higher than the alpha coefficient for the entire set of seven SDT items,

which was .54 (see Appendix C for item list). The items were RT4 (M = 5.28, SD =

.848), EVT8 (M = 5.22, SD = .76), EVT9 (M = 5.10, SD = .80), SDT22 (M = 5.35, SD =

.68), SDT24 (M = 4.67, SD = .94), SDT26 (M = 5.09, SD = .83), and SDT27 (M = 4.90,

SD = .82). This factor is particularly interesting considering how similar are the means

and standard deviations for these items. The reinforcement theory item—"It is important

to be consistent in what behavior gets rewarded"—had the second highest mean after

SDT22 which said, "The more a task or goal is personally interesting to employees the

more likely they are to engage in it, even if it becomes difficult." Consider, also, that

RT4 also correlated with SDT24, which was written to capture the personal interest or

enjoyment dimension of intrinsic motivation in SDT. Recall that personal interest and

enjoyment are unnecessary considerations according to reinforcement theory (Skinner,

1974). Item SDT24 said, "Employees' motivation is optimal when they perform tasks or

pursue goals because they find them enjoyable, rather than to earn some form of

compensation or reward."

Continuing such analysis, what insights might be gleaned from the data that showed those SDT items also loaded with two EVT items? Items EVT8 and EVT9 said, respectively, "Employees are more motivated to take on tasks or projects they personally value than those they do not personally value," and "The more employees value the possible outcomes, the harder they will work." The concept of taking on a task based on it being personally valued seemed not to be differentiated from the personal interest aspect of intrinsic motivation in SDT. Nor was it conceptually distinct from participation in a task or goal based more on personal enjoyment. By extension, it also was not conceptually distinct from the concept within SDT that integrated motivation—and to a lesser extent, identified motivation—is most concerned with participating from a pro-social stance (Gagné, 2003), than from a self-oriented stance. It is possible, then, that the concept of value, particularly when explicitly stated with that word, is conflated with notions of something being personally *valued* because of what it makes one feel or experience (enjoyment), and possibly also with the notion of doing work that could be considered *of value* by and for others. Perhaps such conceptual overlap between aspects of EVT and SDT is what Vroom (1995, p. xxi) saw when he said that were he to conceptualize EVT today he would make some provision for the intrinsic motivation construct (Deci & Ryan, 1985b) as articulated in SDT.

Similarly intriguing factor loadings were also seen in the data from Test Two. Again they involved reinforcement theory items, which formed a factor with three EVT items. The items were: RT19, RT20, EVT25, EVT26 and EVT27. The eigenvalue for this factor using both Varimax and Oblimin rotation methods was 1.18. Nonetheless, this

factor's alpha coefficient (.63) was too low to warrant retention based on the factor alpha criterion of .70 (Nunnally, 1978). Another basis for elimination of this factor and its items was that this study attempted to discern motivation beliefs along the crisp lines of four theories. A factor that cut across theoretical constructs, of course, could not support this goal. However, a deeper analysis of the items themselves raises questions about the reasons the five items clustered together.

Item RT19 says, "Consistent availability of incentives and rewards is essential for sustaining employee motivation." Item RT20, also a reinforcement item, says, "A good way to increase employees' motivation to undertake a goal or project they do not naturally enjoy is to offer an incentive." These two items combined with items EVT25, EVT26, and EVT27. Item EVT25 says, "If the probability of a strategy working is high, motivation for remaining engaged in it is also high." Item EVT26 says, "When the probability of achieving a particular outcome is low, so is the motivation to strive for that outcome." And, finally, EVT27 reads, "Employees' motivation is highest when they believe their effort will lead to good results." Given that RT and EVT contain contradictory concepts, such combinations are intriguing and may warrant future research.

Indeed, data from Test One invite the research question, how do we make sense of the fact that reinforcement theory items joined together in a factor with items from SDT, especially given that SDT is philosophically and operationally antithetical to reinforcement theory? Data from Test Two invites a similar inquiry; why did two items that referred to the consistent need for and the utility of incentives and rewards to

enhance motivation—central concepts in reinforcement theory—combine with items

about the proportional link between one's estimation of future success and the effort one

will expend to engage in or strive for an outcome?

Implications for Research and Practice

The questions posed above—perhaps especially the rhetorical ones—lead to the

implications of this study for the field of motivation research and organizational practice.

The Motivation Beliefs Inventory can be used by researchers to "unpack" the many

motivation beliefs held by individuals in an orderly fashion, and perhaps help researchers

better understand how individuals combine motivation beliefs in their everyday work

lives. This is an important contribution to the field in that the MBI would allow

motivation beliefs to be explored without the constraints imposed by single theories.

While still a self-report instrument, because of its multi-theory structure, the MBI

positively responds to prior motivation researchers' suggestions for studies that extend

beyond the limits of single theoretical perspectives (Elliott, 2004). A thorough review of

the literature confirmed that the vast majority of motivation research is conducted within

a single theoretical framework. But, the lived experience of individuals at work—or

anywhere—is less tidily contained, and so a wider perspective is needed.

Because the MBI is a multi-theory, multi-construct instrument, it and studies like

this one also allow for further exploration of the intriguing combinations of theoretically

contradictory or antithetical beliefs discussed in the section about discarded items and

factors. Typically such data is disregarded on statistical grounds as weak items, error, or

"noise." But, simply conducting a study of this kind allows important questions to be

asked about belief strength and how beliefs are combined, as if the study itself acts as an early step in a grounded theory (Goldkuhl & Cronholm, 2010) methodology. Indeed, such research would more fully heed calls for wider use of broader, even multi-method, research designs (Fulmer & Fritjers, 2009).

In addition to serving researchers, the Motivation Beliefs Inventory can also be a useful tool for practitioners. As a consultant to managers and senior executives, it is common to hear stories of frustration, anxiety, and even anger related with core areas of responsibility associated with employee motivation. The most frequent and emotionally stated examples relate to managers' responsibilities to deliver performance appraisals and annual compensation information to employees. Employees on the receiving end of such manager-employee exchanges often report similar emotions. Very often managers and employees do not understand why they feel anxious about giving or receiving a performance appraisal, or giving information about annual pay changes. One hypothesis is that their individual beliefs about what motivates someone are in conflict with the base assumptions of the systems they are required to work within. It could also be the manager fully supports the motivational premises upon which the organizations systems are based, but on some level recognizes such beliefs are not equally held by the person with whom he or she is talking. The Motivation Beliefs Inventory may help such individuals learn more about manager and employee beliefs as a means of better understanding and more effectively responding to their anxiety or frustration.

Practitioners might be especially interested in the MBI in light of earlier evidence that when individuals form their own everyday theories of motivation they bias them

toward extrinsic motivation (Heath, 1999)—a form of motivation repeatedly shown (Deci et al., 1999) by one of the four theories included in the MBI instrument—SDT—to produce undesired and unintended outcomes. The MBI can be used to open the exploration of alternative motivational concepts that can adjust or elaborate their belief systems; the same can be said for those strictly adhering to SDT beliefs. Richer and more theoretically elaborated understandings of motivation would afford individuals more versatility in responding to the requirements of, and any personal aspirations related to, their work.

Future Directions

Many of the questions posed earlier in this discussion can only be answered with additional research. Before suggesting how research into motivation beliefs might progress, it is important to note there are many methodological considerations related to the following suggestions that are beyond the scope of this paper. Readers are encouraged to refer to Fulmer and Fritjers (2009) for a thorough exploration of the limitations of self-report instruments in motivation research and which and how multidimensional methodologies might be structured to enable even stronger insights.

One such expanded, mixed methodology study inspired by the present study and Fulmer and Fritjers (2009) relates to individual belief systems. Since the four theoretical constructs in the MBI were chosen a priori, future research might consider a grounded theory (Cooney, 2011) approach to map the content and structure of individuals' lay theories of motivation. Thematic analysis of respondents' lay theories may reveal belief content and structure that cannot be classified using existing theories. Identified themes

could then be operationalized in new items written in the language of lived experience. Factor analysis or even hierarchical linear modeling might then be undertaken to discern important structures. Such a mixed methods study might not entirely eliminate the issues associated with self-report research (Fulmer & Fritjers, 2009). It might, though, lessen the impact of common method bias associated with motivation research. One such bias stems from a heavy reliance on self-report survey instruments that frequently incorporate subscales validated within single-theory research studies.

Another possibility relates to discerning the hierarchical structure of motivation beliefs. The Motivation Beliefs Inventory began with an a priori framework of motivation theories. Items were constructed to represent core dimensions of four major theories. While no hypothesis was formulated about the ranking of motivation beliefs in terms of strength, it was not anticipated that among the entire sample in Test Two that many beliefs would be held at nearly equivalent levels of agreement. Recall that all respondents in Test Two rated their beliefs for SDT, EVT, and AMT at statistically similar levels. While a perfectly uniform distribution was not predicted or discovered in this study, a uniform belief level across the four theories is statistically possible. A future study might attempt to create an ipsative—or forced choice— version of the MBI so that respondents are required to rank their preferences. Such a study would shed light on the hierarchy of beliefs, which might then help individuals better learn about the process used—consciously and unconsciously—when selecting beliefs upon which to act.

A predictive validity test of this instrument would also be useful. Such a study could assess a manager's motivation beliefs using the Motivation Beliefs Inventory, and

then employ one or more triangulation methods such as a 360-type feedback analysis (Brutus et al., 2006), direct observation, content analysis of oral and written communication, analysis of diary content, or interviews of coworkers to determine what behaviors the manager actually used. Such a multidimensional study methodology might strengthen data offered from self-report surveys. It might also help highlight any gaps between espoused motivation beliefs and beliefs enacted through behavior. Such a study might then be used to directly inform practice with the participating managers. It might also help organizational consultants craft and better target interventions such as executive coaching and motivation skills training at the difference between espoused motivation beliefs and behavior—and its impact. It may also help consultants and trainers take care to avoid advocating only the latest motivation knowledge or skills without considering what and how existing beliefs might block or facilitate behavior change.

Indeed, both a review of the literature and this author's personal experience consulting with executives globally corroborate that a wide range of motivation beliefs is little understood by business practitioners. In fact, organizational and, more rarely, some motivation researchers have been urging greater understanding of how individual and collective beliefs influence organizational structures, resource allocation, and interpersonal management since the mid-20th century. One notable organizational psychologist even chided managers by calling their assumptions about motivation "asinine" (Levinson, 1973). Nonetheless, motivation beliefs remain little researched by motivation scholars relative to other subjects. More research is needed into not only the content of belief systems and lay theories of motivation, but also how such combinations

of beliefs are formed. Analysis might also consider other dimensions of cognitive, affective and social functioning related to motivation at work.

This latter point is worth elaborating. The extended utility of the MBI created and validated in this study goes beyond the measurement of employee motivation beliefs per the four subscales. Rather, the larger purpose is to help fellow researchers and practitioners elaborate our understanding of the constellation of motivation beliefs and lay theories employees hold about motivation at work—and how they relate to behavior—so that the organization's outputs are produced with more positive psychological and social outcomes. This study resulted in a valid and reliable self-report instrument to measure motivation beliefs using several motivation theories. While the multi-theory approach is novel, the self-report survey aspect of the methodology—however pragmatic and legitimate—is commonplace. Certainly the advantages and criticisms of self-report methodologies are well documented. Perhaps researchers could agree that the self-report methodology in motivation research is too commonplace. If so, perhaps it is now important to employ methodologies that more actively honor and respond to the fact that motivation is a dynamic phenomenon with both psychological and socioenvironmental variables (Veermans & Tapola, 2004) that interact in a performance situation that unfolds over time. After all, the word motivation derives from the Latin movere (Steers, Mowday, & Shapiro, 2004), to move; at the core of motivation is movement. The moving nature of an individual's motivation, then, replete with intrapersonal and interpersonal aspects, all but implores us to use more than a singular, cross-sectional methodology, and even only within-person analysis.

Thus, future research into motivation generally, and motivation beliefs specifically, could make wider use of mixed and longitudinal methodologies. While still leveraging valid self-report surveys like the Motivation Beliefs Instrument, future research might also employ the less common approaches to new instrument creation and validation such as item response theory (Reise, Widaman, & Pugh, 1993), cognitive process theory (Karabenik et al., 2007), and grounded theory (Cooney, 2011). In some combination, such tests may allow researchers the chance to more vigorously scrutinize the applicability of previously validated items and scales to the present question, and even more richly capture aspects of an individual's lived motivational experience that may not easily fit with prior theory. Going further, in addition to the direct observation, content analysis, and 360-degree methodologies suggested earlier, special emphasis should be given to longitudinal research, as so much motivation research is cross-sectional. While the psychometric and practical advantages of self-report methodologies and instruments are well documented—as are the criticisms—perhaps their greatest future service would be as one solid component in a broader inquiry methodology.

Finally, if the heartfelt aspirations of the many organizational and motivation researchers upon whose shoulders this study stands are to be realized, if together we are to intentionally evolve the social science assumptions upon which management behaviors—and by extension, organizational systems—are based, if we are to permanently advance the human side of enterprise (McGregor, 1966) and, thereby, society as a whole, more studies are needed into both individual motivation beliefs, and also into innovations to organizational systems whose structures are rooted in those

beliefs (Osterloh, Frost, & Frey, 2002). Such systems include recruitment and retention, performance management and appraisal, and compensation.

While it is but one example mainly rooted in a single theoretical framework, Pink (2009) cited several companies using approaches to job design, innovation, and compensation that are based broadly on tenets of self-determination theory—a theory rooted in positive psychology's optimistic beliefs about human aspiration and flourishing (Deci & Vansteenkiste, 2004). One might attempt a formal study of such organizational innovations to test their generalizability. Their reliability in terms of the short- and long-term impacts on not only participant beliefs, but also traditionally valued—and legitimate—organizational outcomes such as product or service innovation, competitive performance, and profitability, could also be assessed.

Limitations

Some limitations of the present research are important to note. First, while data were collected from large samples of businesspeople, the database was owned by a consulting company whose business is primarily in the United States. The majority of respondents were likely citizens or residents of the United States. Furthermore, the sample was primarily white/Caucasian. Further validation work is needed using a more demographically diverse sample. The data were also cross-sectional self-report data, some limitations of which were discussed earlier. Further test-retest validation would be helpful. Convergent validity was not tested, as there appears to be no other instruments related to motivation beliefs. Additional validation would be beneficial as and when more motivation beliefs instruments become available. Finally, not all MBI subscales

include items for every dimension of the theories they represent. A larger item pool may allow for wider sub-construct inclusion, which would enhance the explanatory power of the instrument for scholars and practitioners, alike.

Conclusion

Such limitations notwithstanding, the findings in this study represent an important initial step toward enriching our understanding of employee motivation beliefs. This study is thought to be a valuable contribution to the field because it provides a valid, multi-theory measurement tool. This entire study—including discarded items and problematic factors—also offers fresh data to the small pool of prior literature about motivation beliefs. Indeed, exploring motivation beliefs in greater detail using the MBI may allow organizational researchers to add new insights to our understanding about the content of individual mental models (Senge, 1990) and motivation lay theories, and their impact on employee well being, everyday interpersonal leadership, organizational system structures, and valued economic outcomes. Above all, it is hoped that this motivation beliefs study will be used by researchers and practitioners, alike, to accelerate their important efforts to enhance the quality of all outcomes generated in the pursuit of commercial success and profit, including one of the most important, employee well-being.

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Appendix A

Sample Items Drawn from Instruments Identified in the Literature Review

Sample Items Drawn from Instruments Identified in the Literature Review

<u>Appendix Key</u>

Scale	Full Name
AGQ-R	Achievement Goal Questionnaire- Revised
AMS	Academic Motivation Scale
IMI	Intrinsic Motivation Inventory
IMI-SR	IMI for Schizophrenia Research
MAWS	Motivation At Work Scale
PCWS	Psychological Contract at Work Scale
SRSPQ-C	Sensitivity to Rewards Sensitivity to Punishment Questionnaire for Children
VIEMS	Valence Instrumentality Expectancy Motivation Scale
WEIMS	Work Extrinsic Intrinsic Motivation Scale

Theory	Scale	Subconstruct	Original Item
RT	SRSPQ-C	Sensory reward	It is easy for your child to associate taste and smells to very pleasant events.
			There are a large number of objects or sensations that remind your child of pleasant events.
		Responsiveness to social approval	Your child often does things to be praised.
			It is important to your child that they make a good impression on others.
			Your child needs people to show their affection for him/her all the time.
			Your child does a lot of things for approval.
		Sensitivity to punishment	Your child often refrains from doing something because of fear of being embarrassed.
			If your child thinks that something unpleasant is going to happen, they get pretty worked up..
		Impulsivity/Fun seeking	Does your child generally prefer activities that involve immediate reward?
			The possibility of obtaining social status moves your child to action, even if this involves not playing fair.
			Your child does a lot of things for approval.

Theory	Scale	Subconstruct	Original Item
		Anxiety	In unfamiliar tasks, your child worries about failure.
			Your child often worries about things he/she said or did.
		Conflict Avoidance	Your child thinks a lot before complaining about something
			There are a large number of objects or sensations that remind your child of pleasant events
EVT	VIEMS	Valence	I would like to be hired for this job
			It would be good to have a job with the police department.
			I want to get a job with the police department.
		Instrumentality	If you do well on this test, you have a good chance of being hired.
			I think you will be hired if you get a high test score.
			How well you do on this test will affect whether you are hired.
			The higher your test score, the better your chance of getting hired.
		Expectancy	If you try to do your best on this test, you can get a high score.
			If you concentrate and try hard you can get a high test score.
			You can get a good score on this test if you put some effort into it.
AMT	PCWS	Relational dimension of psychological contract	To me working for this organization is like being a member of a family.
			I feel part of a team in this organization.
			I go out of my way for colleagues who I will call on at a later date to return the favor.
			My job means more to me than just paying the bills.
			I feel this company reciprocates the effort put in by its employees.

Theory	Scale	Subconstruct	Original Item
			The organization develops/rewards employees who work hard and exert themselves.
			I am motivated to contribute 100% to this company in return for future employment benefits.
			I have a reasonable chance of promotion if I work hard.
	AGQ-R	Mastery approach goals	My goal is to learn as much as possible in/from this class.
		Master avoidance goals	My goal is to avoid learning less than I possibly could.
		Performance approach goals	I am striving to perform better than the other students.
		Performance avoidance goals	My goal is to avoid performing poorly compared to others.
SDT	IMI	Perceived choice	I felt like I had no choice but to do this activity.
		Interest/enjoyment	I thought this was a very interesting activity.
		Activity value/usefulness	I believe doing this activity could be somewhat beneficial for me.
	IMI-SR	Effort	I put a lot of effort into this.
			I tried hard on this activity.
		Pressure/tension	I did not feel nervous at all while doing this.
			I was very relaxed in doing this activity.
	AMS	Intrinsic motivation (IM) to know	Why do you go to college: Because I experience pleasure and satisfaction while learning new things.
		IM toward accomplishment	For the pleasure I experience while I am surpassing myself in one of my personal accomplishments.
		IM to experience stimulation	For the pleasure I experience when I feel completely absorbed by what certain authors have written.
		Identified motivation	Because this will help me make a better choice regarding my career orientation.
		Introjected motivation	Because of the fact when I succeed in college I feel important.
		External regulation	Because I want to have "the good life" later on.

Theory	Scale	Subconstruct	Original Item
		Amotivation	I can't see why I go to college, and frankly, I couldn't care less.
	MAWS	Intrinsic motivation	Because I enjoy this work so much.
		Identified motivation	I chose this job because it allows me to reach my life goals.
		Introjected motivation	Because I have to be the best in my job; I have to be a "winner."
		External motivation	I do this job for the paycheck.
	WEIMS	Intrinsic motivation	Because I derive much pleasure from learning new things.
		Integrated regulation	Because it has become a fundamental part of who I am.
		Identified regulation	Because this is the type of work I chose to do to attain a certain lifestyle.
		Introjected regulation	Because I want to succeed at this job, if not I would be very ashamed of myself.
		External regulation	Because this type of work provides me with security.
		Amotivation	I don't know, too much is expected of us.

Appendix B
Sample Demographics for Tests One and Two in Percentage

Sample Demographics for Tests One and Two in Percentage

	Test One, $n = 1,322$	Test Two, $n = 712$
Male	41	44
Female	59	56
Manager	73	73
Non-manager	27	27
Race		
American Indian or Alaskan Native	1	0
Asian	5	5
Asian Indian	2	1
Black, African American	4	2
Pacific Islander	1	1
White/Caucasian	80	85
Other	7	6
Education		
High School Graduate	3	3
Some College	11	11
Associates Degree	6	4
Bachelors Degree	38	38
Masters Degree	37	39
Doctoral Degree	5	5
Date of Birth		
1901-1924	0	0
1925-1942	1	1
1942-1960	49	51
1961-1981	48	47
1928-2002	2	1

Appendix C
Items Included in Test One

Items Included in Test One

Item Count	Theory	Test One Item Code	Item
1	RT	RT1	Employee behavior at work can be reliably controlled through the use of rewards and/or punishment.
2		RT2	Rewards and/or punishment are a good way to get an employee to focus on what is important.
3		RT3	Employee behavior is easily changed by new reward systems.
4		RT4	At work, punishment is an effective way to eliminate unwanted behavior.
5		RT5	The best way to ensure high performance is to make sure rewards such as compensation and praise are tied to performance.
6		RT6	Most employees prefer to do work that involves immediate rewards.
7		RT7	At work, punishment is an effective way to eliminate unwanted behavior.
8	EVT	EVT8	Employees are motivated to choose the approach they think gives them the highest probability of success.
9		EVT9	The more employees value the possible outcomes, the harder they will work.
10		EVT10	Employees are motivated to choose the approach they think gives them to highest probability of success.
11		EVT11	At work, people are motivated when they believe their actions today will take them one step closer to success.
12		EVT12	At work, people are more likely to engage in a task, activity, or project when they think the probability of success is high.
13		EVT13	For most employees, the probability of success usually determines how much effort they will put in.
14		EVT14	An employee's motivation is maximized when they believe they can achieve the desired result.
15	AMT	AMT15	In general, employees work to accomplish goals in order to fulfill their personal needs (i.e. to have an impact on people and processes, to be liked by others, and to attain more competence.)
16		AMT16	At work, how people go about achieving goals depends on whether they tend to approach success, or try to avoid failure.
17		AMT17	In general, employees are motivated based on their individual needs for achievement, for positive relationships, and to be influential.
18		AMT18	When it comes to work, people's motivation is based on how important it is to them to compete against a previous performance standard.

Item Count	Theory	Test One Item Code	Item
19		AMT19	People at work generally prefer goals that allow them to satisfy their personal need to gain approval and please others.
20		AMT620	People at work generally make decisions and choose behaviors based on their need for power.
21		AMT21	At work, employees are motivated to engage and persist in projects based on their human needs for achievement, to be liked by others, and also to influence people or processes.
22	SDT	SDT22	The more a task or goal is personally interesting to an employee, the more likely they are to engage in it, even if it becomes difficult.
23		SDT23	At work, an employee's motivation is significantly influenced by how much autonomy they have to choose what they work on and/or how they work on it.
24		SDT24	An employee's motivation is optimal when they perform tasks or pursue goals because they find them enjoyable, rather than to earn some form of compensation or reward.
25		SDT25	Employees have an inherent need to be competent at what they do.
26		SDT26	An employee experience greater vitality and well-being when they engage in tasks that contribute to something greater than themselves.
27		SDT27	If an employee does not naturally enjoy the project they are working on, they can still experience high quality motivation if they believe the project is aligned with their personal values.
28		SDT28	Promising rewards for an activity that employees personally enjoy decreases their motivation to engage in that activity.

Appendix D
Items Included in Test Two Also Showing Retained Items from Test One

Items Included in Test Two Also Showing Retained Items from Test One

Item Count	Theory	Test One Item Code	Test Two Item Code	Item
1	Reinforce-ment	RT1	RT1	Employee behavior at work can be reliably controlled through the use of rewards and/or punishment.
2		RT2	RT2	Rewards and/or punishment are a good way to get an employee to focus on what is important.
3		RT3	RT3	Employee behavior is easily changed by new reward systems.
4		RT7	RT4	At work, punishment is an effective way to eliminate unwanted behavior.
5			RT17	Withholding rewards is an effective way to discourage unwanted behavior.
6			RT18	At work, positive reinforcement of a behavior is necessary to ensure the continued use of that behavior.
7			RT19	Consistent positive reinforcement is a highly effective way to tell an employee to keep doing what they are doing.
8			RT20	A good way to increase employees' motivation to undertake a goal or project they do not naturally enjoy is to offer an incentive.
9			RT21	The best way to get an employee to stop doing something is to offer an incentive to do something else.
10	Expect-ancy Valence	EVT10	EVT5	Employees are motivated to choose the approach they think gives them the highest probability of success.
11		EVT12	EVT6	At work, people are more likely to engage in a task, activity, or project when they think the probability of success is high.
12		EVT13	EVT7	For most employees, the probability of success usually determines how much effort they will put in.
13		EVT14	EVT8	An employee's motivation is maximized when they believe they can accomplish the desired result.
14			EVT22	Employees will expend the greatest effort on strategies they think will most likely help them accomplish their outcomes.
15			EVT23	As long as a task is thought to be a means to a valued end, it will be highly motivating.
16			EVT24	Employees' motivation is highest for goals they

Item Count	Theory	Test One Item Code	Test Two Item Code	Item
				think will lead to bigger opportunities in the future.
17			EVT25	If the probability of a strategy working is high, motivation for remaining engaged in it is also high.
18			EVT26	When the probability of achieving a particular outcome is low, so is the motivation to strive for that outcome.
19			EVT27	Employees' motivation is highest when they believe their effort will lead to good results.
20	Achieve-ment Motiva-tion	AMT15	AMT9	In general, employees work to accomplish goals in order to fulfill their personal needs (i.e. to have an impact on people and processes, to be liked by others, and to attain more competence.)
21		AMT17	AMT10	In general, employees are motivated based on their individual needs for achievement, for positive relationships, and to be influential.
22		AMT19	AMT11	People at work generally prefer goals that allow them to satisfy their personal need to gain approval or please others.
23		AMT21	AMT12	At work, employees are motivated to engage and persist in projects based on their human needs for achievement, to be liked by others, and also to have an influence on people or processes.
24			AMT28	Employees are more likely to strive for achievement when faced with hard goals rather than easy goals.
25			AMT29	Highly challenging goals stimulate employees' need for achievement more than less challenging goals.
26			AMT30	Striving to accomplish something that has never been done before is naturally motivating to most employees.
27			AMT31	Employees who work harder than others to achieve difficult goals do so because they have a higher need for achievement.
28			AMT32	Competing to beat a previous performance record is naturally motivating for employees.
29			AMT33	Employees' motivation is maximized when asked to achieve challenging goals.
30			AMT34	Accomplishing something that has never been done before is more motivating to employees than receiving the compensation or reward.

Item Count	Theory	Test One Item Code	Test Two Item Code	Item
31	Self-Determin-ation	SDT22	SDT13	The more a task or goal is personally interesting to an employee, the more likely they are to engage in it, even if it becomes difficult.
32		SDT23	SDT14	At work, an employee's motivation is significantly influenced by how much autonomy they have to choose what they work on and/or how they work on it.
33		SDT24	SDT15	An employee's motivation is optimal when they perform tasks or pursue goals because they find them enjoyable, rather than to earn some form of compensation or reward.
34		SDT26	SDT16	Employees will experience greater vitality and well-being when they engage in tasks that contribute to something greater than themselves.
35			SDT35	Employees are motivated to get things done because they have an intrinsic need to contribute to something greater than themselves.
36			SDT36	Timelines and performance expectations undermine employees' motivation to engage in activities they find inherently interesting and enjoyable.
37			SDT37	Employees naturally want to engage in work that allows them to express their personal values and interests.
38			SDT38	Employees' motivation is enhanced over the long term when they believe that the organization's interests and goals are aligned with their personal interests and goals.
39			SDT39	At work, an employee's motivation is significantly influenced by how mutually supportive their relationships are with others.
40			SDT40	More than just wanting to be increasingly competent, employees have an inherent desire to grow as human beings.
41			SDT41	The more pressured or controlled employees feel, the poorer their motivation.
42			SDT42	Employees have an inherent need to expand and grow, which is the primary reason they "work."

Appendix E
Final Motivation Beliefs Inventory Item List

Final Motivation Beliefs Inventory Item List

Item Count	Theory	Test One Item Code	Test Two Item Code	Final Instrument Item Code	Item
1	Reinforce-ment	RT1	RT1	rt1	Employee behavior at work can be reliably controlled through the use of rewards and/or punishment.
2		RT2	RT2	rt2	Rewards and/or punishment are a good way to get an employee to focus on what is important.
3		RT3	RT3	rt3	Employee behavior is easily changed by new reward systems.
4		RT7	RT4	rt4	At work, punishment is an effective way to eliminate unwanted behavior.
5		-	RT19	rt5	Consistent availability of incentives and rewards is essential for sustaining employee motivation.
6	Expectancy Valence	EVT12	EVT6	evt1	At work, people are more likely to engage in a task, activity, or project when they think the probability of success is high.
7		EVT13	EVT7	evt2	For most employees, the probability of success usually determines how much effort they will put in.
8		EVT14	EVT8	evt3	An employee's motivation is maximized when they believe they can accomplish the desired result.
9		-	EVT26	evt4	When the probability of achieving a particular outcome is low, so is the motivation to strive for that outcome.
10		-	EVT27	evt5	Employees' motivation is highest when they believe their effort will lead to good results.
11	Achieve-ment Motivation	-	AMT28	amt1	Employees are more likely to strive for achievement when faced with hard goals rather than easy goals.

Item Count	Theory	Test One Item Code	Test Two Item Code	Final Instrument Item Code	Item
12		-	AMT29	amt2	Highly challenging goals stimulate employees' need for achievement more than less challenging goals.
13		-	AMT30	amt3	Striving to accomplish something that has never been done before is naturally motivating to most employees.
14		-	AMT33	amt4	Employees' motivation is maximized when asked to achieve challenging goals.
15		-	AMT34	amt5	Accomplishing something that has never been done before is more motivating to employees than receiving the compensation or reward.
16	Self-Determina-tion	SDT26	SDT16	sdt1	Employees will experience greater vitality and well-being when they engage in tasks that contribute to something greater than themselves.
17		-	SDT37	sdt2	Employees naturally want to engage in work that allows them to express their personal values and interests.
18		-	SDT38	sdt3	Employees' motivation is enhanced over the long term when they believe that the organization's interests and goals are aligned with their personal interests and goals.
19		-	SDT39	sdt4	At work, an employee's motivation is significantly influenced by how mutually supportive their relationships are with others.
20		-	SDT40	sdt5	More than just wanting to be increasingly competent, employees have an inherent desire to grow as human beings.