

**GOAL CLARITY, CRITICALITY AND PERFORMANCE: A
LABORATORY EXPERIMENT**

by

DERRICK MASON ANDERSON

(Under the Direction of Barry Bozeman)

ABSTRACT

Goal-setting theory (GST) is among the most validated and replicated theories of motivation. A central assertion of GST is that encouraging employees to pursue clear goals leads to greater performance benefits than encouraging them to pursue vague goals. This assertion motivates many recent government reform efforts and GST is being integrated into public management research and theory. Public Administration perspectives on goals have filled important knowledge gaps in GST related to the causes of organizational goal ambiguity, various subdimensions of goal ambiguity and the relationship between organizational and individual level goals. This dissertation builds upon GST by examining the joint performance effects of goal clarity and task criticality. A 3x2 factorial design laboratory experiment was conducted using a sample of students (n=214). Treatments included goal clarity and task criticality. Results indicate that goal clarity increases performance. Task criticality has no effect on performance in groups with

either no goal or a vaguely specified goal. Task criticality has a negative effect on performance when goals are highly specified.

INDEX WORDS: Public management, organizational theory, organizational behavior, organizational goals, goal-setting theory, task complexity, laboratory experimentation

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For Summer, Reagan, Kennedy, Mom & Dad

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CHAPTER 1

DISSERTATION OVERVIEW

Introduction

Goals play an increasingly important role in the management of government agencies. For example, in 2011 the Office of Management and Budget (OMB) launched the high profile Performance.gov initiative that provides free access to a database of the federal government's latest performance goals. Goals can be sorted according to their type, theme or agency ownership.¹ Goals are central features of reform efforts throughout government (Kettl 2000) and have developed a reputation as a panacea for a host of ills facing all sorts of organizations (Ordóñez et al., 2009).

The mechanisms through which goals increase individual and organizational performance have been studied extensively. Empirical evidence from field and laboratory studies have repeatedly demonstrated that encouraging individuals to pursue clear goals leads to greater performance benefits than encouraging them to pursue vague goals or to simply do their best (Locke & Latham, 2002). This is the central premise of goal-setting

¹ See www.goals.performance.gov/goals_2013

theory (GST), a theory of motivation that has been developed over several decades of robust inquiry. GST is particularly relevant to public management research and practice. This dissertation discusses how and why this is the case then turns to an empirical examination of the extent to which the performance benefits of goal clarity are influenced by task criticality. Task criticality is a subdimension of task importance that focuses on the extent to which “failure in the task causes negative consequences” (Bowers et al., 1994, p. 208). Using a laboratory experiment, this dissertation demonstrates that goal clarity increases performance but task criticality does not. Despite being closely related to importance, the findings relative to criticality depart from the conventional view on task importance seen in the GST literature. Though unanticipated, these findings are explainable and underscore the need to expand what is known about specific types of task importance and their functional roles in regulating the effectiveness of goals in performance.

Overview of Chapter 2

Chapter 2 sets the theoretical stage for this dissertation by presenting a public administration perspective on GST. This chapter begins with a discussion of GST that focuses on its intellectual roots and operational mechanisms. GST’s relevance to public administration theory and practice is discussed. Public administration researchers have done more than merely

borrow GST; they have also addressed some important gaps in the literature. Specifically, they have shed light on the organizational origins of goal ambiguity (Rainey, 1983), dimensions of goal ambiguity (Chun & Rainey, 2005a, 2005b) and the relationship between organizational and task-level goal clarity (Wright, 2004). These issues are discussed before turning to opportunities for future research. There are at least two areas where public administration perspectives may contribute to GST: (1) the relationship between bureaucratic and structure-oriented personality types and goal achievement, and (2) the relationship between subdimensions of task importance, specifically task criticality, and goal achievement.

The trend in GST research is to focus on task importance as a moderator of goal commitment. However, due to its subjective nature and multiple subdimensions, task importance proves to be an elusive topic for meaningful empirical examination. Thus, efforts to engage meaningful proxies for importance have been made (for example, see Grant's (2008) field experiment examining task significance). Task criticality, the degree to which "failure in the task causes negative consequences," (Bower et al. 1994, 208) is suggested as a proxy for task importance that is relevant to both private and public management.

Overview of Chapter 3

Chapter 3 provides a discussion of several important issues with respect to laboratory experimentation in public administration research. Important calls for more experimentation, especially laboratory experimentation, have been made (Perry 2012, Brewer and Brewer 2011, Bozeman and Scott 1992). The essay presented in Chapter 3 adds to these calls. Chapter 3 begins with a discussion of knowledge production in public management research. Next, the importance of causal inference for scholarly and practical public management research is discussed. A selection of the field's previously published laboratory experiments is reviewed. Finally, several practical considerations relative to implementing laboratory experiments are addressed.

Overview of Chapter 4

Chapter 4 begins the empirical portion of this dissertation. Hypotheses relative to goal clarity, task criticality and their interaction are provided. To test these hypotheses, a 3x2 factorial design laboratory experiment was implemented. Experimental treatments include goal clarity (no goal, low clarity goal, or high clarity goal) and task criticality (task critical or task not critical). As such, there are a total of six experimental treatment groups to

which 214 student subjects were randomly assigned. Subjects were required to complete a computer-enabled data transcription task in a fixed amount of time. Entry-level, routine-types of work are typically overlooked in public management research. This is unfortunate because this type of work plays an important role in the operations of organizations. Goal setting is one area where routine work is easily integrated into research and theory. Under these conditions, careful attention is placed on designing an experimental task that is relevant to the entry-level worker. Specifically, the experimental task outlined in Chapter 4 is designed to include a sequence of low to moderately difficult micro-tasks.

Overview of Chapters 5 & 6

Chapter 5 provides the results of the experiment. The dependent variable is task performance measured along dimensions of quantity and quality. More specifically, performance quantity is the number of data items transcribed (irrespective of accuracy) and performance accuracy is the number of data items coded accurately. Two-way ANOVA is used to assess statistical significance in the differences between means for each treatment condition. Additional hypothesis testing is provided through multivariate regression predictions of performance for each treatment group first without, and then with individual-level controls thought to influence ability such as age, years in college, employment status, majoring in the sciences or

engineering, or fluency in English. Results indicate that goal clarity increases performance but task criticality does not. In the case of highly specified goals, task criticality reduces performance. This is statistically significant when controls are added.

Chapter 6 provides a discussion of results. Findings relative to goal clarity are consistent with previous research. Findings relative to task criticality, on the other hand, deviate from the traditional GST view of task importance. These findings may be explained by looking beyond GST to the psychology of performance and anxiety. The view that certain dimensions of task importance may increase performance while other dimensions, specifically criticality, may reduce performance is supported by the “challenge-stressors” perspective on performance (Cavanaugh et al., 2000). Chapter 6 concludes with a discussion of limitations facing the present study and opportunities for future research.

CHAPTER 2
A PUBLIC ADMINISTRATIVE PERSPECTIVE ON GOAL-SETTING
THEORY

Introduction

The central premise of goal setting theory (GST) is that encouraging individuals to pursue clear and difficult goals yields greater performance benefits than encouraging them pursue vague goals or to simply do their best (Locke et al. 1990). GST is among the most replicated and validated theories of motivation (Miner, 2005). GST is met with a robust and venerable research tradition that transcends the boundaries between organizational studies, psychology, management and, increasingly, public administration. The unique context of public organizations relative to goal clarity—as manifest in allegations that public agencies operate amidst problematically vague goals—makes GST particularly relevant to the study of public administration. This relevance is magnified by the attention placed on goals in recent government reforms (Kettl, 2000).

This chapter reviews the main features of GST and describes how it has been integrated into public administration research. Public

administration perspectives build on mainstream GST research by considering the organizational origins of goal ambiguity (Hal G. Rainey, 1993), dimensions of goal ambiguity (Chun and Rainey 2005a, 2005b) and the relationship between organizational and task-level goal clarity (Wright 2004). A review of these contributions is provided followed by a discussion of two areas where public administration perspectives may further enhance the development of GST.

Exploration of the effects of task criticality is one area where a public administration perspective may contribute to GST. The empirical portion of this dissertation employs a 3x2 factorial design laboratory experiment to examine this issue. Experimental treatments include goal clarity (no goal, a goal with low clarity, and a goal with high clarity) and task criticality (no or yes). This chapter concludes with a brief discussion of this experiment.

Roots of Goal Setting Theory

Motivation is a compelling topic in the study of organizations and few theories of motivation are as well supported by field and laboratory evidence as GST (Miner 2005). The proliferation of empirical evidence supporting GST may be partially attributed the significance of goals in many motivation and management perspectives such as social cognitive theory (Bandura, 1994), resource allocation theory (Kanfer et al., 1994), control theory (Klein, 1989)

and performance-contingent financial incentives (Jenkins et al. 1998). Early inspiration for GST came from the view in psychology and management that action and effort may be consciously regulated towards achieving desired performance outcomes (see Deci & Ryan, 1985; Ryan & Ryan, 1970). For example, Atkinson (1958) observed that high levels of effort were associated with moderately difficult tasks and low levels of effort were associated with both extremely difficult and extremely simple tasks. Thus, there is an inverted U-shaped relationship between task difficulty and effort. This view deviated from mainstream management and psychology perspectives on motivation until the late 1970s. Until this point the popular view was that effort regulation occurred primarily through extrinsic motivators such as performance based financial incentives (Locke and Latham 2002). In this atmosphere, GST was developed and advanced through the 1980s by Locke who was influenced and later joined by Latham (Miner 2005). To this day, GST is closely associated with the joint work of Locke and Latham.

The primary emphasis of early GST research was directed towards the effects of goal difficulty on performance (Earley, Connolly, & Ekegren, 1989; Huber, 1985; Wood, Mento, & Locke, 1987). Complementing the work of Atkinson (1958), Locke and Latham found that clear but difficult goals are associated with greater effort than easy or unclear goals (Locke et al. 1990). It was observed that clear, difficult goals increase performance through (1) directing action towards activities that are relevant to goal achievement, (2)

increasing effort duration and intensity, (3) increasing persistence, and (4) stimulating learning behaviors and strategy development (Earley et al., 1989; Huber, 1985; Locke et al., 1990)

Operational features of goal-setting theory

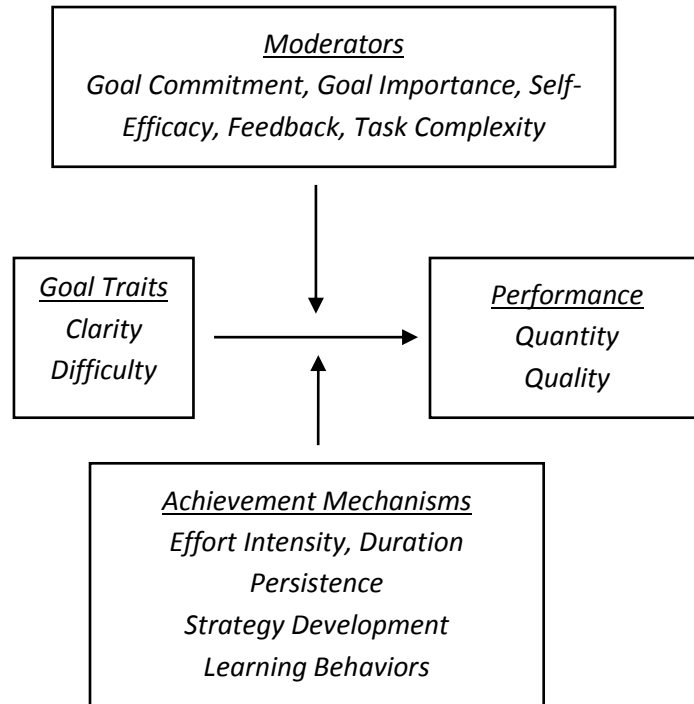
The robust research enterprise surrounding GST has proffered a number of useful insights into factors that moderate the benefits of goal setting. For example, the performance benefits of goal setting are dependent in part on goal commitment (Seijts & Latham, 2000) which increases with goal difficulty (Klein et al., 1999). Task importance in the context of GST is seen as a determinant of goal commitment. Task importance relative to goal achievement is increased by managerial factors such as having workers publicly commit to a goal (J. R. Hollenbeck & Klein, 1987), leadership assignment of goals (Latham & Saari, 1979a), and implementation of performance-contingent financial incentive mechanisms (Latham & Kinne, 1974; Edwin A. Locke, Motowidlo, & Bobko, 1986).

Self-efficacy is a known to increase the benefits of goal setting (Bandura, 1994; Locke & Latham, 2006; Locke et al., 1986; Schunk, 1990). It has been demonstrated that in the context of self-set goals, individual with high levels of self-efficacy have higher levels of goal achievement (Bandura & Cervone, 1983; Zimmerman, Bandura, & Martinez-Pons, 1992), are less likely

to be dissuaded by negative feedback (Bandura & Locke, 2003) and are more likely to develop achievement strategies (Earley et al., 1989).

Figure 1 (adapted from Locke and Latham (2002)) provides a general overview of the main features of goal setting theory and their relation to performance. As outlined in Figure 1, goal clarity and difficulty predict performance and are moderated by factors including goal commitment (J. R. Hollenbeck & Klein, 1987; Klein et al., 1999), self-efficacy (Bandura 1994), managerial feedback (Nemeroff & Cosentino, 1979; Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988) and task complexity (Earley, 1985; Wood et al., 1987). The mechanisms through which goals work towards determining performance include effort intensity, effort duration, persistence, strategy development and learning behaviors (Schunk, 1990).

Figure 2.1—Main Features of Goal-Setting Theory
(Locke and Latham 2002)



Goal Setting Theory in Public Administration Research

Like many theories of motivation, goal setting theory has important theoretical and practical relevance to the management of public organizations. In practice, a central premise of many government reform efforts is the notion that performance can be enhanced through reducing ambiguity in organizational goals and reinforcing managerial accountability for accomplishing these goals (Kettl, 2000; Lee et al., 2009). Government reforms in the United States including the Program Assessment Rating Tool (PART) and the Government Performance and Results Act (GRPA) and the

Public Service Agreement (PSA) in the United Kingdom all reference goals as performance enhancement mechanisms. Prophetically, Perry and Porter (1982) predicted that goal oriented reforms would be increasingly appealing in the practice of public management by virtue of their non-monetary motivational logic.

The bulk of attention in GST research is oriented towards the individual or the task as a unit of analysis. GST researchers tend to overlook the fact that goals often play integral roles in political and economic views of the organization. Such views commonly allege² that public organizations experience greater levels of goal ambiguity than private organizations (Allison, 1983; Dahl & Lindblom, 1953; Downs, 1967; Drucker, 1980; Lowi, 1979). These allegations are sometimes coupled with claims that goal ambiguity results in a host of undesirable conditions such as poor performance, low worker commitment (Buchanan, 1974), decreased motivation (Jung & Rainey, 2011, p. 31), and rule orientation and bureaucratization (Warwick, 1975). Despite the frequency of such claims little attention has been oriented towards their empirical validation (Lee et al. 2009, 459). Even fewer studies consider the comparative public-private nature of organizational goal ambiguities and their effects. The few empirical research studies that have been conducted suggest that there is

² It is important to underscore the fact that many claims relative to goal ambiguity in public organizations lack empirical evidence and are thus allegations. This dissertation is careful to use the term “allegation” to denote claims that lack specific empirical evidence.

little difference in public and private managers' assessments of their respective organizations' goal ambiguities (Rainey & Bozeman, 2000).

The neglect of organizational level considerations in mainstream GST research has resulted in some important knowledge gaps. Public administration researchers have been able to address some of these knowledge gaps in their efforts to integrate GST into the field's research traditions. Most notably, researchers have contributed theoretically and empirically to knowledge of the organizational origins of goal ambiguity (Rainey 1993), dimensions of goal ambiguity (Chun and Rainey 2005a, 2005b) and the relationship between organizational and task-level goal clarity (Wright 2004). Turn now to a discussion of these contributions.

The Origins of Goal Ambiguity in Public Organizations

The origins³ of organizational goal ambiguity are important considerations for management theory and practice. The origins of organizational goal ambiguities are influenced by a number of forces including external factors such as markets and politics, managerial factors such as resources and performance measurement, and organizational factors such as regulatory mission and financial publicness (Lee et al 2009, 463).

³ The term "origins" as used here refers to causes or determinants.

Impetus for examining the organizational origins of goal ambiguity is founded in the paradigmatic assertion of GST that clear goals lead to better performance outcomes than vague goals. Given the apparent axiomatic nature of this assertion, why do some organizations, especially public agencies, continue to operate under the auspices of ambiguous goals? The answer to this question is multifaceted but can be summarized by noting that in some instances organizational goal ambiguity cannot be avoided and in other instances it may be intentional.

Consider first the perspective that public sector organizational goals are inevitable. Organizational goal clarity in private sector organizations can be attributed to market relations. More specifically, private firms often have relationships with markets that permit important information signaling in the form of profits, sales, and prices that are easily integrated in the goals (Lee et al. 2009). Public organizations lack market relationships that enable the translation of signals into clear goals (Rainey 1983).

A related view on the inevitability of public sector goal ambiguity emphasizes the nature of goods and services offered by public organizations. The value of such non-market goods may be laden with political and social considerations for which clear, objective measures of organizational value and performance are difficult to ascertain (Chun and Rainey 2005a). Difficulty in assessing value and performance may result in difficulty to articulate clear organizational goals.

Ambiguous goals may also arise at the hands of poor legislative abilities. Learner and Wanat's (1983) notion of "fuzzy mandates" suggests that law-makers sometimes lack the political or technical ability to craft legislation that results in clear organizational mandates (which then translate into clear organizational goals). This idea is complemented by the work of Potoski (2002) which suggests that, in the case of state-level law-making bodies, professional (or full-time) legislatures are often more capable than citizen (or part-time) legislatures at crafting technically sophisticated laws.

Not all vaguely crafted laws are the results of incompetence. Turn now to the view that goal ambiguity in public organizations may be intentional. One reason for intentionally drafting vague legislation is problem complexity (Lindblom, 1959). It is anticipated that the administrative discretion afforded to government agencies through vaguely crafted legislation may result in superior problem solving through mobilization of subject matter expertise (Matland, 1995; Schneider & Ingram, 1990). In such cases lawmakers trade control and clarity for specialized knowledge and expertise in anticipation of better problem solutions.

The need for compromise in satisfying the competing interests of multiple stakeholders may also lead to intentional organizational goal ambiguity (Boschken, 1994; Boyne, 2002). Clear goals may be seen as a liability to an organization that must meet the needs of multiple

stakeholders. Ambiguous goals may contribute to organizational flexibility which helps in serving diverse interests.

Dimensions of organizational goal ambiguity

Thoughts on the origins of organizational goal ambiguity are closely related to research on the dimensions of goal ambiguity. Chun and Rainey (2005a, 2005b) view organizational goal ambiguity as “the extent to which an organizational goal or set of goals allows leeway for interpretation, when the organizational goal represents the desired future state of the organization” (Chun and Rainey 2005b, 531). Chun and Rainey (2005a, 3-4) have identified the following dimensions of organizational goal ambiguity: mission comprehension ambiguity, directive goal ambiguity, evaluative goal ambiguity, and priority goal ambiguity. Their research has shown that various organizational characteristics such as age, financial publicness, regulator authority, and size are significant predictors of goal ambiguity.

Connecting organization and task-level goal ambiguities

The claim that organizational characteristics may influence individual behaviors is fundamental to organizational studies. Early in the development of GST, Baldwin (1987) empirically observed a positive association between

clarity of goals at the organizational level and motivation at the employee level. Baldwin did not, however, offer any insight into the mechanisms through which organizational level goal clarity translated to increased motivation. Wright (2004) developed a theoretical model to examine the channels through which organizational goals influence motivation. Findings suggest that organizational goal ambiguity may translate to job goal ambiguity through managerial feedback mechanisms (Wright 2004). Later research (Pandey & Wright, 2006) demonstrated that political influences may contribute to organizational goal ambiguity, which in turn, increases role ambiguity.

**Goal-Setting Theory in Public Administration Research:
Opportunities for future contributions**

Personality

In evaluating the state of GST research, Locke and Latham (2002) note that little is known about how personality influences the benefits of goal-setting. This observation signals an opportunity for future public administration research involving GST. Some theories of motivation particularly relevant to public administration research—namely public service motivation and prosocial motivation—deal closely with personality.

Researchers in these areas of motivation have identified goals as integral theoretical constructs that are under-examined (James L. Perry, 2000; Wright, 2004). Admittedly, the expressed focus here is on issues of motivation and not personality, however, some theories of motivation specifically oriented towards public service overlap with personality research (Borman, Penner, Allen, & Motowidlo, 2001; Finkelstein, Penner, & Brannick, 2005; Goldberg et al., 2006; A. M Grant, 2008; Pandey & Stazyk, 2008).

In addition to examining personality and GST indirectly through public service and prosocial motivation, there are several important public service personality topics that stand to more directly relate to GST. Specifically, public administration research has addressed such topics as bureaucratic personality (Bozeman & Rainey, 1998) and bureaucratic orientation (DeHart-Davis, 2007; Scott, 1997). It is reasonable to assume that these personality types take well to highly structured work environments and may respond positively to clear goals, perhaps even leading to even greater performance benefits than what is seen in individuals without these personality traits. Empirical evidence to support this claim may contribute to important government reform discussions relative to goals. However, this assumption has not been examined. Other measures of personality not yet incorporated into public management research, such as the personal need for structure (Neuberg & Newsom, 1993), may contribute to both theory on personality and public sector goal setting.

Task criticality

An understanding of task criticality in the context of GST begins with an overview of the related but broader topic of task importance. Task importance is assumed to play a role in goal achievement and performance through enhancing an individual's perception of their work as meaningful (Locke and Latham 2002). Organizational scholars examining issues of work and organizational commitment have demonstrated that the importance of a work sometimes influences important commitment behaviors such as decisions to stay with or leave an organization (Friedlander & Walton, 1964) or responsiveness to incentives (Collins 1988, Matheson 2012).

In the context of GST, task importance is viewed primarily as a determinant of goal commitment (Locke and Latham 2002). Theory and research on the role of task importance in goal achievement is largely limited to considerations of the small range of managerial behaviors thought to increase goal commitment. Such behaviors include having workers publicly commit to a goal (Hollenbeck, Williams and Klein, 1989), leadership assignment of goals (Ronan, Latham, Kinne 1973; Latham and Saari 1979b), and implementation of performance-contingent financial incentive mechanisms (Latham and Kinne 1974; Lee, Locke, and Phan 1997). Little attention is placed on the characteristics of the task as determinants of

importance. This may be attributed, at least in part, to the subjective nature of task importance. What is important to one worker may not be important to others.

The elusive nature of task importance seems to have played a role in recent efforts to narrow the frame of reference. For example, in task performance research, Grant (2008; 2007) has considered the effects of task significance rather than task importance. However, as Grant (2008) indicates, task significance is also not well understood. In the context of elusive proxies and subdimensions of task importance, the notion task criticality offers promise. Task criticality in the context of organizational research has been operationalized as the degree to which “failure in the task causes negative consequences” (Bower et al. 1994, 208). Like importance and significance, levels of task criticality may be dependent upon perceptions. However, the orientation towards the anticipation of negative outcomes may provide a context through which researchers might more readily examine the effects of task characteristics.

Like task importance and task significance, it is difficult to claim that task criticality is somehow within the exclusive domain of public organizations. As such, the view taken here is not that task criticality has a specific public sector meaning but rather that task criticality is an important general management concept that is relevant public organizations.

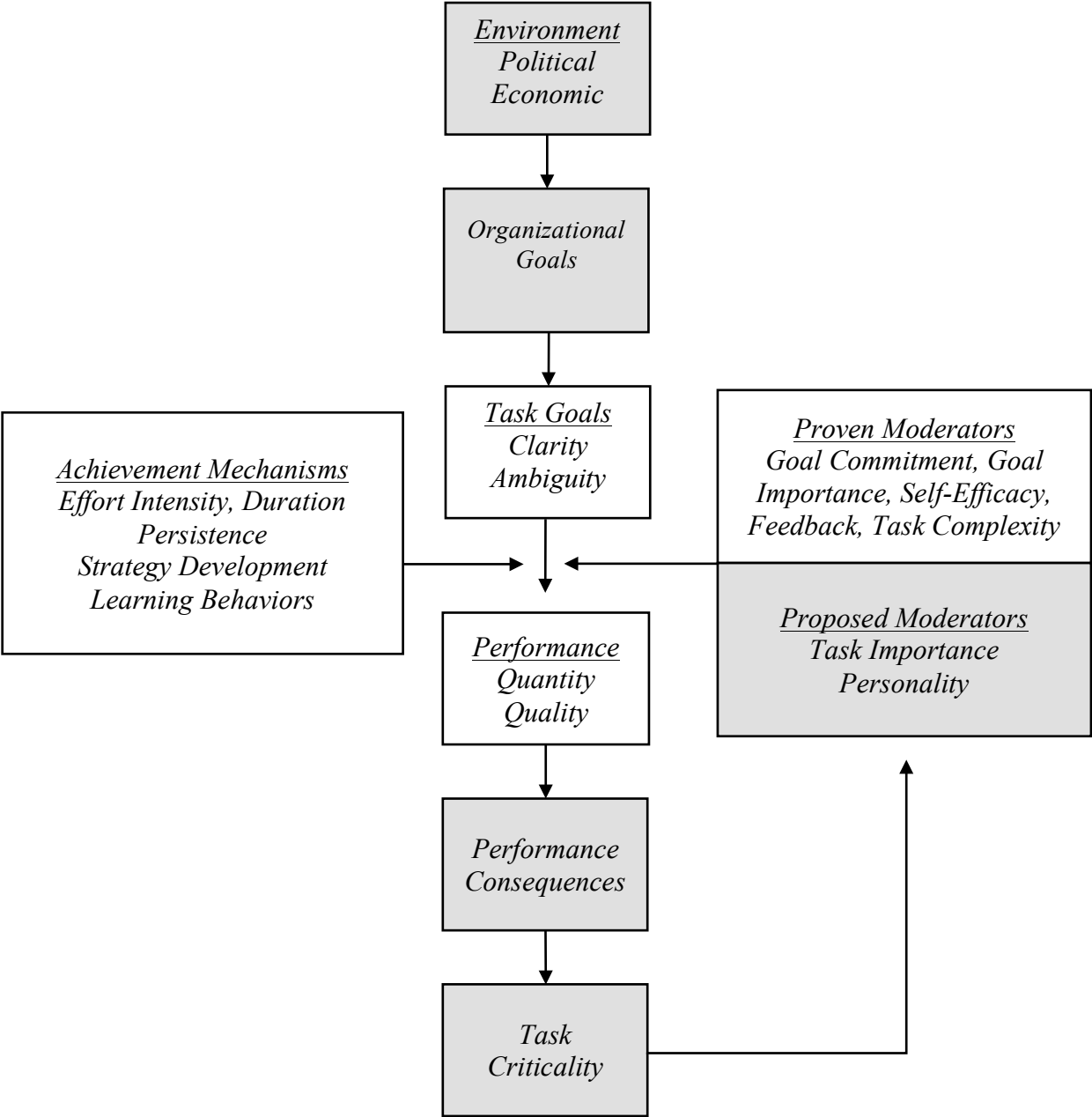
As a brief illustration of the relevance of task criticality to public organizations, consider the legal framework under which federal government agencies in the United States cease operations in times of fiscal crisis. In the absences of operational resources, government agencies, like private organizations, are forced to reduce or cease operations. In the case of government agencies, the work of some individuals is deemed critical to the extent that failure to perform their work “would result in an imminent threat to the safety of human life or the protection of property” (US Congressional Research Service, 2004). Under these conditions, entire classes of government workers are required by law to be sufficiently resourced even in the case of government shutdown. These workers are deemed essential on the basis of the criticality of tasks they are responsible for performing. These include, as enumerated by the Office of Management and Budget (1980), certain workers who monitor public health and safety, control air traffic, protect and surveil the border, investigate crimes, and respond to emergencies and disasters.

Conclusion

This chapter has aimed to demonstrate that GST is a theory of motivation that is relevant to public administration theory and practice. Researchers in the field have done more than merely borrow GST; they have also addressed important gaps in the literature. Specifically, they have shed

light on the organizational origins of goal ambiguity (Rainey 1993), dimensions of goal ambiguity (Chun and Rainey 2005a, Chun and Rainey 2005b) and the relationship between organizational and task-level goal clarity (Wright 2004). Future research in public administration may add to these areas as well as at least two other important areas: (1) the relationship between relevant personality types and goal achievement and, (2) the relationship between subdimensions of task importance, specifically task criticality, and goal achievement. Figure 2.1, above, provides a general view of the operational features of GST from the perspective of Locke and Latham (2002). The public administration perspective presented here provides several important expansions to this conceptual framework. These expansions are provided in Figure 2.2, below. The shaded boxes represent these important extensions.

Figure 2.2—A public administration perspective on GST



These extensions play an important role in the remainder of this dissertation. Chapter 4 presents hypotheses relative to the joint effects of goal clarity and task criticality and outlines a laboratory experiment that was

designed to test these hypotheses. This experiment requires subjects to perform a routine data transcription task. Experimental treatments include three levels of goal clarity (no stated goal, a stated goal with low clarity and a stated goal with high clarity) and two conditions of task criticality (critical or not critical). The results of this experiment are provided in Chapter 5 and then discussed in Chapter 6. Hypothesis testing through laboratory experimentation is rarely seen in public administration research. As such, the next chapter provides an overview of laboratory studies and their contributions to public administration research and theory.

CHAPTER 3
LABORATORY EXPERIMENTS IN PUBLIC MANAGEMENT
RESEARCH: UNFULFILLED PROMISE

Introduction

As a science, the primary ambition of research in the field of public administration and management is to generate valid knowledge. The ultimate pursuit in the realm of scientific knowledge production is the assessment of causality between variables of interest. Experiments are the optimal tool for making such assessments. For this reason, they are a primary method of inquiry in many of the social sciences and play a growing role in many more. It is true that experiments, especially laboratory experiments, are neglected by public administration researchers. This neglect is understandable. As Bozeman and Scott (1992) observed, researchers in the field have a tendency to trade internally valid knowledge produced in the laboratory for externally valid knowledge available in the field. Research in public administration is often produced with use in mind; field studies are generally thought to hold better prospects for generating knowledge that is applicable to multiple organizational and environmental settings.

Still, important calls for more experimentation, especially laboratory experimentation, have been made (Perry 2012, Brewer and Brewer 2011,

Bozeman and Scott 1992). The essay presented here adds to these calls. Understanding that the characteristics of desired knowledge shape the ways in which it is pursued, this essay begins with a discussion of knowledge production in public management research. Next, the importance of causal inference for scholarly and practical public management research is discussed. A selection of the field's previously published laboratory experiments is reviewed. Finally, several practical considerations relative to implementing laboratory experiments are addressed.

Knowledge Production in Public Management Research

Public administration research follows multiple methodological traditions. The absence of significantly entrenched modes of discovery allows researchers to redirect inquiry towards desired types of knowledge, including fundamental research and “usable knowledge” (Lindblom & Cohen, 1979). One aspiration in this regard includes the production of useable knowledge. The most idealistic prospects of such an aspiration suggest benefits for both public administration theory and practice. Empirical evidence on social science knowledge utilization—and theories such as Caplan's (1975, 1979) “two communities theory”—suggests a gap between social science knowledge production and its use in practice. While this so-called gap can be attributed to many factors, it is reasonable to suggest that neglect of certain modes of

inquiry may inhibit the field's capacity to produce high quality useable knowledge. Fortunately, the absence of entrenched methodological or epistemic traditions may allow the field to successfully turn towards incorporating neglected modes of inquiry. Experimentation is one such neglected mode of inquiry.

Experiments are rarely used public administration research despite the vital role they play in generating knowledge of causal relationships. In a call for more laboratory research the editor of one prominent journal commented, "Well-designed experiments, in combination with other methods, hold the prospect for advancing our pursuit of useable knowledge" (Perry 2012, 408). Laboratory studies are used widely in related fields, including management, where Scandura and Willams (2000) include them among the primary methods seen in the literature, and economics where Falk and Heckman (2009, 535) note that they have become so prominent as to justify the emergence of specialized journals dedicated to their exhibition. Yet, they remain neglected in public administration.

Gulick's call for a science of administration (1937) marked the beginning of an atmosphere of confusion as to the status of public administration as an art, science or profession that lingers today (Perry and Kraemer 1986; Raadschelders 2011; Lynn 1996). Rather than contributing substantively to this discussion, the present essay takes the relatively unambitious position that public administration's knowledge production

functions can be considered scientific and its other functions may grant it status as art or profession.

As a science, the principal objective of empirical research in public administration is to generate valid knowledge. The ultimate challenge in this regard is to establish the extent to which causal relationships exist between variables of interest. The logic of nomothetic explanation—the prevailing framework under which scientific notions of causality are defined—necessitates the simultaneous existence of three criteria when explaining causal relationships: correlation between variables; appropriate time order relationship between cause and effect (the cause precedes the effect in time); and non-spurious relationships between cause and effect (Cook & Campbell, 1979). Experiments are common sources of knowledge production in the social sciences and the optimal research designs for assessing causality (Falk & Heckman, 2009).

There are variations in the ways experiments can be implemented. Field experimentation includes random assignment of individuals to experimental treatment conditions in field settings. Experimental designs that examine causality through mechanisms with relaxed (though still systematic) randomization protocols are termed “quasi-experiments”. Designs that provide for the random assignment of individuals to treatment and control groups and the manipulation of experimental variables in a controlled physical setting are designated “laboratory experiments” or “laboratory

studies”. In organizational research, it has been noted that laboratory experiments allow investigators “to make stronger statements concerning cause and effect relationships between theoretical constructs than usually can be made in field research” (Dobbins et al. 1988).

Causal Inference for Scholarly and Practical Public Administration Knowledge Production

Emphasizing the importance of causal inference, Cook and Campbell provide that “the paradigmatic assertion in causal relationships is that the manipulation of a cause will result in the manipulation of an effect” (1979, 36). As an applied science, this assertion has an important implication for public management research: establishment of a causal relationship may be exploited for management and policy purposes. In advocating for more laboratory experiments in practice oriented research, one scholar argued that “studies must give priority to the provision of more reliable information about the full range of outcomes and the causal patterns that are associated with them” (Goggin, 1986, pp. 334–335).

Perry and Kraemer note that research methods in the field can be evaluated by their potential to produce “useable knowledge” (1986, 215). They offer a taxonomical description of research linked to the manipulation of causal relationships for policy purposes. Specifically, they offer a model of

research development wherein studies progress through six stages including stage three, “establishment of causality among the variables” and stage four, “manipulation of causal variables for policy formation purposes” (Perry and Kraemer 1986, 216). This underscores the importance of examining causality for practical purposes. In turn, this goes to suggest that experiment-based research is important to public administration practice as it is the foremost methodology for examining causality.

In the classic literature, Simon and Divine (1941) advocate applied experiments and provided a review of technical challenges that may arise with their implementing in management settings. Simon and Divine observe in the case of industrial research, that experimentation has been used to demonstrate how “production varies when conditions of work are altered” (1941, 485). They go on to show that demonstrating such dynamics through an experiment, though beneficial, may be challenging. They invoke the physical science-social science dichotomy in noting that the setting of the physical science laboratory is more conducive to manipulation of experimental treatments than the social science setting. In a decidedly encouraging tone, Simon and Divine provide that careful planning and execution can help experiments provide “valuable information to assist [the manager] in his task of management (1941, 485).

More recently, Jason Colquit (2008), in a letter from the editors of *Academy of Management Journal*, sought to motivate efforts to assess

causality through experimentation. He offered that a “scholar with expertise in motivation might advise an organization to use specific and difficult goals in its performance management system. That scholar would feel more comfortable making such a recommendation if he or she truly believed that specific and difficult goals *cause* increases in task performance (Locke & Latham, 1990)” (Colquitt, 2008, p. 616). The benefit is not just for the increase confidence of scholarly experts. There is at least some evidence that knowledge consumers value the causal inference derived from experimentation. Gano and colleagues (2007) set out to explore knowledge production and consumption in government agencies, including the United States Department of Health and Human Services (HHS). They found that knowledge consumers vary in the criteria they use to evaluate knowledge. Some interview respondents expressed high regard for knowledge produced through controlled experiments and cite experiments as “gold standards” in scientific research (2007, 49).

The Case Against Experimentation

Despite evidence, both old and new, that laboratory experiments are relevant to both theory and practice, there are many instances where the approach is singled out for criticism. Critics’ views highlight important considerations relative to adopting this approach. Weiss and Rein note that a

significant body of work in the field is oriented towards evaluating and understanding “broad-aim” programs—those programs that “hope to achieve nonspecific forms of change-for-the-better, and which also, because of their ambition and magnitude, involve unstandardized, large-scale interventions and are evaluated in only a few sites” (1970, p. 97). They caution that such programs are poorly suited for examination through experiment-based research. In another vein of criticism, Behn (1996), argues that important constructs in public management research are too complex and multi-faceted for meaningful examination in the laboratory. Behn alleges that “controlled experiments are not well adapted to the task of testing a seven-component theory such as motivation management” (1996, 96).

These critiques underscore the range of factors contributing to the neglect of laboratory experiments in public administration. It is true that a significant portion of the lines of research in the field consider organizations as primary units of analysis. Organizations are ill-suited for examination in laboratory settings. It is also true that many management and administrative constructs are highly complex and multifaceted. Highly complex and multifaceted social science constructs are also ill-suited for examination in laboratory settings. Writing on this subject to the community of organizational scholars more generally, Dobbins and colleagues note that “if a researcher is interested in estimating the general satisfaction level of clerical workers, laboratory research is clearly inappropriate. If, on the other

hand, the question is one of understanding factors which produce satisfaction in clerical works, then laboratory methodologies could be used” (1988, p. 282).

Longstanding and venerable criticism of experimentation is rooted in the method’s poor prospects for fostering externally valid findings. However, a study may still yield important contributions even if its findings fare poorly in dimensions of generalizeability. In advocating the experimental approach for theory building in sociology, Lucas (2003) notes that “experiments often seek to test theoretical relationships, rather than to generalize findings” (240). He goes on to note that “when an experiment is designed to test theoretical principles, to ask whether the experiment’s sample allows for generalization to a larger population is to ask the wrong question” (2003, 241). The challenge in this regard is one of identifying the appropriate role of experiments in a greater knowledge production enterprise.

Overview of Laboratory Experiments in Public Administration Literature

While many lament the lack of laboratory experiments in the literature, few—perhaps none since Bozeman and Scott (1992)—have attempted to inventory what is available. In an admittedly limited effort to do so, the author of this essay conducted two Google Scholar article searches on the contents of three of the field’s leading journals, one using the search

term “experiment” and the other “laboratory”. The journals were *The Journal of Public Administration Research and Theory (J-PART)*, *The American Review of Public Administration (ARPA)*, and *Public Administration Review (PAR)*. Since Bozeman and Scott (1992) provide a review of laboratory studies published before 1992 the chief focus was on articles published after 1992.

Within the described search parameters no laboratory experiments were identified in *ARPA* or *PAR*. By extending the time parameter back to 1986, one article published in *PAR* was identified: Shangraw’s (1986) study of the effects of using computers to process information for decision making. There were ten laboratory experiments published in *J-PART* between 1991 and 2011, five of which were published in a special series on laboratory experiments in public management edited by Barry Bozeman (1992).⁴ The five that were not part of this special issue included an examination of decision quality and confidence conducted by Landbergen and colleagues (1997), Scott’s (1997) study of the determinants of bureaucratic discretion, Schwartz-Shea’s (1991) test of in-group and out-group cooperation in decision making, Nutt’s (2006) comparison of differences in decision making behaviors between public and private sector managers, and Brewer and Brewer’s (2011) examination of the effects of sector differences on motivation.

Laboratory experiments are regarded by social scientists as totems of rigorous scientific inquiry. The concentration of laboratory studies published

⁴ These include the work of Landsbergen and colleagues (1992), Coursey (1992), Bretschneider and Straussman (1992), Wittmer (1992) and Thurmaier (1992).

in a single journal may reflect the journal's success in attracting particular types of research. In the absence of empirical evidence, one can only speculate as to why the journal placement of these articles is so concentrated. However, public administration has been broadly criticized for lacking methodological sophistication (Gill and Meier 2000). A likely inference to be taken from the lack of laboratory studies published in public administration journals is that scholars with the capacity to perform these studies look to other venues to publish their work. Only five of the ten laboratory experiments published in *J-PART* are not part of the 1992 special series⁵ and only four of those have been published in the twenty years since then. This adds to the view that public administration scholars may prefer to publish laboratory studies in journals of related, more scientifically sophisticated fields where the tradition of experimentation is more robust. There are several such examples. Miller and Whitford's (2002) test of the limits of incentives and the promises of trust in principal-agent relationships is featured in the *Journal of Theoretical Politics*. Findings from Bozeman and Shangraw's study of the use of computers in managerial decision making have been published in *Science Communication* (Bozeman and Shangraw 1988) and *Knowledge, Technology & Policy* (Bozeman and Shangraw 1989). Bozeman collaborated with McAlpine in a study of goals and bureaucratic decision making that was published in *Human Relations* (Bozeman and McAlpine 1977). Bretschneider

⁵ These include Schwartz-Shea (1991); Landsbergen and colleagues (1997); Nutt (2006); Brewer and Brewer (2011); Scott (1997)

and colleagues have published work on budgetary decision making in *Policy Sciences* (1988).

Examples of public administration's laboratory experiments

Scholars with experiment-based research ambitions can look to the exemplary features of previous studies. This section provides a review of several of these studies from the 1990's through today. A special emphasis is placed on each study's design features and findings. The chief, though not exclusive, focus of existing laboratory experiments is decision making—an important topic throughout many decades of public administration research. This review places a special emphasis on these studies in an attempt to underscore the notion that laboratory experimentation can be viewed as a compliment to even the field's most venerable lines of research and theory. Under this reasoning the literature is divided into two sections. The first section reviews studies that examine the how individual traits influence decision making. The focus here is on cognitive processes and individual characteristics as predictors of various aspects of a decision. In most of these studies, the dependent variable is a characteristic of an end-product decision or an individual's attitude towards this decision. The second section reviews articles examining how variations in qualities of information and environments influence decision making. These studies are particularly

relevant to research addressing the use of technology for public administration decision making.

These studies share many commonalities, not least among which is that fact nearly all of these scholars were at Syracuse University's Maxwell School of Citizenship and Public Affairs at approximately same time—the late 1980s to the early 1990s. Bozeman, Bretschneider, and Straussman were faculty and Coursey, Whitmer, Thurmaier, Landsbergen, and Shangraw were doctoral students. This suggests that a single institution can generate a significant positive impact on the field's adoption of laboratory studies, an important observation for those interested in exploring ways to generate more of this type of research. Turn now to a review of studies examining individual characteristics and decision making.

Individuals and Decision Making

Scientists who study decision making have observed a range of decision processes adopted by individuals and groups. Coursey (1992) based his study on the observation that individual decision makers express preferences for certain decision making processes. Accordingly, the theory of credibility logic (Bozeman 1986; Bozeman and Landsbergen 1989) asserts that individuals making decisions will subjectively assess the credibility of relevant information on a variety of dimensions including the source of the

information. The central feature of credibility logic is the observation that perceptions of believability take precedence over scientific quality when determining the value of information or knowledge. At the same time, cognitive response theory asserts that a decision maker's response to information is dependent upon a personal scheme of relevant experience. Coursey proposes that cognitive response theory emerges as a prevailing mechanism guiding decision making only after credibility judgments are made pursuant to credibility logic theory. Information is presented and evaluated in terms of its credibility and then subjected to the processes of cognitive response before decision is made.

Credibility logic, according to Coursey, is especially relevant to decisions where benefits are perceived as being extremely high or extremely low. Instances experiencing lower marginal benefits will be viewed more favorably if they experience higher levels credibility. Coursey's experiment engages graduate students in a hypothetical decision making environment wherein they are required to consult various types of analyses in making recommendations for potential investments of government resources. Findings from this study suggest a minimal influence of credibility in the presence of high perceptions of benefits. Similarly, in instances where benefits are perceived to be low, highly credibility information is preferred or at least more persuasive than information of low credibility.

In a related study of how individuals navigate decision making scenarios, Landsbergen and colleagues (1992) note that internal rationality-based models of decision-making operate amidst an assumption that a rational or good decision can be made. A criticism of this theory is that the criterion wherein a decision maker arrives at a rational decision varies across individuals. This study examines the effects of perceived decision difficulty on the use of various decision criteria. Subjects for this study included both public managers and graduate students. The laboratory protocol required subjects to evaluate a proposed telecommunications program that would provide subsidized technologies to low-income households. Subjects were provided an analysis of the program that touched on costs and benefits. Additionally, expert evaluations of the analysis were provided, each invoking different evaluative criteria. Subjects were asked to make a policy recommendation. Following their recommendation they were asked to assess the influence of the various expert evaluations. The authors find that decision makers use a variety of decision evaluation criteria but tend towards weighting more heavily those criteria that he or she can evaluate on a personal basis.

The authors note that decision makers may appear to approach decision process in highly idiosyncratic and unsystematic ways. However, controlling for the context wherein the decision is made and the types and quality of information available provides a layer of stability and

predictability to decision making processes. That is to say, when holding constant the type of decision, the context of the decision, the quality of the information, and the type of information made available to the decision maker, behaviors become more stable and predictable. The authors are careful to indicate that their findings do not support claims that decision makers behave rationally. Stability and predictability may be related to rationality but they are unique concepts.

In a complementary study of rationality, Bretschneider and Straussman (1992) demonstrate that decision makers have limited capacities to incorporate scientific estimations of uncertainty. In motivating their study, the authors looked to work in psychology attempting to assess the fundamental nature of confidence intervals in human judgment. Such work focuses on the extent to which human judgment accommodates failures of statistical inference and reasoning and decision making. Much of this work focuses on the correlation between confidence and accuracy. For example, some of the literature in psychology notes that experienced decision makers tend to have high confidence in their decisions yet the accuracy of their predictions are no greater than the accuracy of inexperienced decision makers.

In their laboratory study, Bretschneider and Straussman introduce subjects to a hypothetical decision making environment involving municipal finance. Subjects included graduate students in public and business

administration who were randomly assigned to different decision making capacities in a hypothetical local government. A variety of information was provided including budget forecasts coupled with forecasts errors. Subjects were asked to recommend a budget ceiling based on the information provided. After making recommendations, subjects were asked to assess their confidence in their recommendations then estimate how precise their estimation must be in order for it to conform to the confidence specified. The authors find that individuals in their study recognize the negative relationship between confidence and precision; however, they fail to link confidence and precision to the variance of the structure of the phenomena. They argue that their findings are consistent with the work on human judgment in general but this work adds to this literature in suggesting that individuals fail to connect concepts of confidence and precision to natural variation in focal phenomena.

Wittmer (1992) also examines decision making but shifts the focus to ethical sensitivity. In this study, subjects were asked to assume a hypothetical managerial role and make decisions in this capacity. Relying upon university students as test subjects, this experiment required that each subject be presented with a set of problems. Included in these problems was one touching on an ethically sensitive issue. In this case, the issue described an opportunity for a manager to gain a competitive advantage by using information that was acquired through means that were indisputably

unethical. Wittmer finds that individuals with higher levels of ethical sensitivity are more likely to make decisions that are consistent with socially agreed-upon standards of ethical managerial behavior. The author argues that this is important because it is anticipated that specialized education can increase ethical sensitivity which can in turn yield ethically acceptable managerial decision.

Information and Environments in Decision Making

At a time when computer use was becoming increasingly common among public servants, Shangraw examined how individuals' experience with computers may influence decision making practices (Shangraw 1986,). The specific focus of decision making in this experiment was information consumption. Shangraw introduced subjects to a decision making environment wherein relevant information related to adoption of a flexible time schedule was provided in both computer display and print formats. Using midcareer graduate students as subjects, Shangraw controlled for the level of computer knowledge and decision commitment to demonstrate that increased knowledge of computers increases the likelihood that a person will prefer consuming information on a computer more than information in print.

In a more recent study, Nutt (2006) compares decision making in a government agency and a business firm. In this study, a scenario-type

experiment is developed wherein participants are asked to assess the risk and prospects of adopting particular organization-level budget scenarios. The scenarios varied in the ways at which budgets were developed. It was anticipated that public sector managers would favor instances wherein bargaining and networking were used to arrive at a budget decision, whereas private sector managers would favor instances wherein analysis and speculation were used to arrive at decisions. Nutt finds that public sector managers are less likely to support budgets reinforced by analysis but they are more likely to support budgets that are arrived at through bargaining. The author also finds that private sector managers are more inclined to support budgets that are generated through analysis and less likely to support budgets that are arrived at through bargaining. The author argues the private sector managers are problematically disinterested in the importance of bargaining and overly confident on the benefits of analysis. The author also notes that public sector managers place too much emphasis on the importance of bargaining. This experiment found that public sector managers are more likely to observe the limits of formal analysis.

Landsbergen and colleagues (1997) add to the field's understanding of decision confidence. This study critically examines technologies that help in the decision making process. An expert system (ES) is a computer modeling technology designed to simulate the human decision process. With the emergence of these technologies questions have emerged concerning the

extent to which they actually improve the decision making processes. This article examines the relationship between the quality, confidence, and commitment of the decision aided by an expert system. In this study, test subjects consisted of graduate students at several universities. They were exposed to a hypothetical decision making scenario wherein they were asked to select the top three job applicants from a pool of ten. Participants were randomly assigned to treatment groups including a group where information was presented on paper, a group where information was presented on a computer based expert system, and a group where information was provided on a computer based expert system with expansion capabilities. Upon making a decision, each subject was provided a solution that contradicted their decisions and their commitment to their decision was assessed. The authors find that decision makers using expert systems were able to make higher quality decisions but display lower confidence and commitment in their decisions.

The remainder of this essay takes into consideration a few of the more pressing challenges and opportunities associated with fostering an experiment-based research enterprise within the field of public administration.

Challenges and Opportunities Facing Laboratory Experimentation in Public Administration

In many respects, conditions have experienced little change in the twenty years since Bozeman and Scott observed that neglect of laboratory experiments in public administration seemed almost “studied” (1992, 293). In making their assessment Bozeman and Scott provide suggestions for scholars who seek to adopt laboratory experiments: increase attention to issues of mundane realism, use individuals and *ad hoc* groups as subjects but not real groups, avoid deception through creativity in role playing, include public managers as test subjects, and finally, combine laboratory experiments with field studies (1992, 309-310). This final section builds upon these recommendations of twenty years ago; they are indeed still relevant. Two issues worthy of additional attention are realism and resource management. Turn first to issues of realism.

Realism

Laboratory experiments can be evaluated along dimensions of realism, of which there are many subcomponents. One way to organize issues of realism is to consider factors of experimental and mundane realism (Dobbins et al. 1988; Carlsmith et al. 1976; Singleton and Straits 2009). Experimental

realism pertains to the extent to which subjects perceive the experiment to be realistic. Subjects in an experiment with high levels of experimental realism will respond to treatments naturally and honestly. The experiment will be implemented pursuant to a protocol and in an environment that fosters realistic and natural human behavioral responses to treatment conditions. Mundane realism (Berkowitz & Donnerstein, 1982) pertains to the extent to which laboratory conditions and experimental treatments approximate actual behavioral settings or what Rosenthal and Rosnow (1991) term “naturalistic settings”. To a certain extent, mundane realism represents a form of external validity that public administration researchers can address through good design. Mundane realism can be enhanced by having subjects execute experimental tasks that are relevant to and representative of tasks conducted by public sector workers. For example, toy assembly, a common task used in psychology research (Jenkins, et al. 1998), is arguably less relevant to public administration than developing a budget recommendation as seen in Nutt (2006).

In public administration, many experiments involve laboratory hypothetical situations; few require subjects to make decisions outside of an artificial scenario. For example, Coursey (1992) introduces subjects to a hypothetical decision making environment to examine the interaction of credibility logic and cognitive response theory. Designs that require subjects to participate in hypothetical scenarios have low levels of experimental

realism as individuals are confined to hypothetical behaviors. Merely asking subjects to pretend they are public administrators or budget analysts will likely lead to filtered behavioral responses. In an effort to enhance experimental realism, the laboratory analog is proposed as an alternative to the hypothetical scenario. Schwartz-Shea (1991) adopts this approach in her study of group decision making through a game theory lens.

In this study the author finds that discussion increases in-group cooperation in decision making settings. The author designs a multistage game consisting of several in-groups and out-groups. She argues that the findings from this study can be used to describe the relationship between agencies and departments. Variables in this small group experiment include levels of discussion permitted and the format in which discussion is allowed. In this case, subjects were required to make real decisions and were provided real monetary compensation based on the decision outcome. Subjects were able to maximize compensation through cooperation in environments where opportunities for discussion varied. This represents a significant departure from the body of experiments in public administration that typically rely on hypothetical and scenario based protocols.

Brewer and Brewer (2011) also avoid the challenges of hypothetical scenarios in their test of the effects of sector designation on work motivation. In this case, the authors introduced students to a “psychomotor vigilance task to investigate [the extent to which] manipulation of sector funding made a

difference in participants cognitive performance” (355). In this study, university students were asked to perform a simple task on a computer. Prior to beginning the study, subjects were randomly assigned to groups wherein they were informed that their work was funded by either a government agency or a business firm. Brewer and Brewer find that “when individuals believe their work is sponsored and funded by a government agency, they perform significantly faster, more accurately and more vigilantly” (358).

The studies performed by Schwartz-Shea (1992) and Brewer and Brewer (2011) have high levels of experimental realism. In each case, subjects were introduced to experimental conditions that required them to execute real tasks rather than make hypothetical decisions. However, these studies exhibit relatively low levels of mundane realism—the experimental conditions provided to subjects fall short of approximating realistic public sector work atmospheres. In the case of Schwartz-Shea (1992), the small group decision game can only be relevant to the proposed models of department-agency interactions after positing significant assumptions. Similarly, it is unclear how well the psychomotor vigilance task used by Brewer and Brewer (2011) represents the type of work commonly done by public servants. These observations illustrate the challenges researchers face as they balance prospects for feasibility and various notions of realism in executing laboratory experiments. The benefits and costs of promoting experimental realism at the expense of mundane realism may be inestimable.

Experimental subjects and resource management

The practice of using students in experimental research in organizational studies is long criticized along theoretical lines (Dobbins et al., 1988; M. E. Gordon, Slade, & Schmitt, 1986). For example, one critic argued that “generations of colleges students have toiled in university laboratories solving problems they did not create, learning syllables they have never seen before, and selecting applicants for hire in nonexistent organizations” (Gordon et al., 1986, 191). However, there is empirical evidence suggesting that students and managers have very little difference in their behavioral responses to some management related experimental treatments (Remus 1989; Remus 1986b). This suggests that the benefits of this approach (cost and recruitment efficiency) may out weight the costs (external validity). Moreover, since many laboratory experiments in management research use task performance as a dependent variable (Bonner & Sprinkle, 2002; E. A. Locke, Shaw, Saari, & Latham, 1981; Wageman & Baker, 1997), there may be some benefit in drawing samples from student populations where variations in ability (a predictor of performance) are often constrained by college admissions requirements.

This observation is particularly relevant to the issue of resource management. One barrier to adopting laboratory studies is cost. Laboratory

studies are generally more expensive than field studies. Similarly, conducting a laboratory study using actively employed public sector managers as experimental subjects is likely to be more expensive than using student subjects. Resource management is an important issue for experimentalists in the social sciences. The majority of costs associated with conducting a lab study are generally associated with participation incentives for subjects. The sample size required to generate a study with sufficient statistical power can be determined by following approaches such as those provided by Cohen (1962, 1988). However, in review of much of the literature, it is apparent that these approaches are not discussed. This may be partially attributed to the fact that they hinge on the factoring of multiple components, some of which are constant (or rather, fixed by convention) and others inestimable. For example, in the approach outline by Cohen (1988), sample size should be determined by a function of the Type I error rate (fixed by convention), the desired level of power (fixed by convention) and the estimated population effect size (determined by the population size which is often inestimable) (Kraemer, 1991; Legg & Nagy, 2006; Nakazawa, 2011). Thus, in practice, sample size is determined largely by resources. This leads, generally, to small sample sizes and methodological innovations to control for their relatively low power such as treatment-only experimental designs (Collins, Dziak, & Li, 2009). Methodologists have on the one hand supported efforts to preserve resources (Collins et al., 2009; Edwards, Lilford, Braunholtz, & Jackson,

1997) and on the other hand argued that findings of low-powered studies are so problematic as to render their adoption unethical (Bacchetti, Wolf, Segal, & McCulloch, 2005; Halpern, Karlawish, & Berlin, 2002; Janosky, 2002). Confounding this issue is the fact that the laboratory experiment is the relied upon method of inquiry for diverse fields wherein standards for best practice may diverge. Thus, it has been argued that sample size calculations are “mystical” (Schulz & Grimes, 2005).

Table 1, below, provides evidence to support the claim that standards for appropriate sample size vary widely. The table shows the number of treatment groups and overall sample size for five separate studies. All studies adopt the same general research design: a 2x2x2 factorial design. All studies have 8 treatment groups with the exception of the study conducted by Crossland and colleagues (2000), which has twice that number as they conducted two parallel 2x2x2 experiments. Despite adopting the same design structure, the overall sample sizes range from 24 to 149.

**Table 3.1—Overall sample sizes of select 2x2x2 factorial design
laboratory studies**

| Article | Journal | Topic | Treatment Groups | Treatment Groups (overall N) |
|---|---|--|-------------------------|-------------------------------------|
| (Crossland, Herschel, Perkins, & Scudder, 2000) | Journal of Organizational and End User Computer | Decision making effectiveness and the use of GIS technologies | 16 | 142 |
| (D. L. Dossett & Greenberg, 1981) | Academy of Management Journal | Supervisor-subordinate interactions, performance, and goal setting | 8 | 80 |
| (Harrington, McElroy, & Morrow, 1990) | Journal of Educational Computing Research | Computer based training, computer anxiety, task errors | 8 | 74 |
| (Sirin & Villalobos, 2011) | Presidential Studies Quarterly | Attribution of credit and blame to the President of the US | 8 | 149 |
| (Thompson, et al 2001) | Psychological Science | Exposure to classical music and test performance | 8 | 24 |

The view taken here with regards to sample size and resource management is twofold. First, public administration’s aspiring experimentalists should be aware that the challenge of limited resources is not new to social science experimentation. Second, as mentioned above, it is true that views on the statistical power calculations vary across fields and the approach for determining sample size is not explicitly discussed in many articles. Still, public administration’s aspiring experimentalists should be deliberate in determining and discussing their sample sizes. This is

particularly important as the field does not have a strong laboratory tradition from which to assess appropriateness in this area.

Conclusion

While public administration should not seek to become an experimental social science, experimentation can complement existing and emerging lines of inquiry. Enhancing the quality of causal inference may improve the field's scientific standing. Integration of laboratory tradition could be achieved incrementally. For example, Weibel and colleagues (2010) leverage the benefits of laboratory studies without so much as performing one. Their meta-analysis of experimental designs focusing on pay for performance draws on studies from business management, psychology and economics, where relevant experiment-based studies are readily available.

Collaboration represents a second opportunity for incremental improvement. Bozeman and Scott (1992) note that a lack of experience and knowledge of experiment-based research designs contributes to their underrepresentation in the literature. This condition can be improved through collaboration with scholars in fields better suited for experiment-based research. A nice example of this is the work of Brewer and Brewer (2011). In this case, one of the co-authors is a public administration scholar and the other is an experimental psychologist. Established scholars may look

increasingly to collaborations with peers in other fields as a path towards advancing the field's scientific rigor.

It has been noted that the scientific sophistication of research in public administration is suboptimal (Gill & Meier, 2000). The tradition of methodological criticism in public administration is “long and venerable” but not always valuable as “most critics understandably prefer to take broad shots across the bow, aiming at no particular individuals and complaining generally about the sorry state of affairs in the field they criticize” (Bozeman and Feeney 2011, 150). The essay presented here seeks to deviate from this tradition by highlighting a specific problem and discussing specific opportunities for improvement.

Until now the promise of laboratory experiments for public administration has been left unfulfilled. However, there is much to look forward to for those who seek to fulfill the promise. A field's methodological advancement in the area of laboratory experimentation can occur across a relatively short period of time. In the early 1990s laboratory experiment papers comprised a mere 3 percent of articles published in leading economic journals (Falk and Heckman 2009). Today, laboratory studies in economics are very prominent. This development can inspire confidence and signal opportunity. Further opportunity can be seen in coupling our field's proclivity for internet survey research with the latest innovations in laboratory experimentation using the internet. Many routine economic, managerial and

other human interactions have moved to the internet. Social scientists have long considered the potential to conduct laboratory experiments on the internet (for example, see: Birnbaum, 2000; Ma & Nickerson, 2006; Shen et al., 1999)). Recent literature has seen increasingly creative implementation of classic laboratory studies on the internet, including studies of decision making and collaboration (Edelman, 2012) and the notion of the “remote laboratory” has been proffered as lens for experimentation (Ma & Nickerson, 2006). This is all to say that there are significant opportunities for public administration researchers to fulfill the promise of laboratory experiments and in so doing generate more useable knowledge.

CHAPTER 4

HYPOTHESES AND EXPERIMENTAL DESIGN

Introduction

The central premise of GST is that encouraging individuals to pursue clear and difficult goals yields greater performance benefits than encouraging them to pursue vague and easy goals or to simply do their best (Locke et al. 1992). GST is among the most replicated and validated theories of motivation (Miner 2005, Locke 2004). It is met with a robust and venerable research tradition that transcends the boundaries between organizational studies, psychology, management and, increasingly, public administration. As discussed at length in Chapter 2, public administration researchers have more than merely borrow GST; they have also addressed important gaps in the literature. Specifically, they have shed light on the organizational origins of goal ambiguity (Rainey 1993), dimensions of goal ambiguity (Chun and Rainey 2005a, Chun and Rainey 2005b) and the relationship between organizational and task-level goal clarity (Wright 2004).

This dissertation aims to carry on in this tradition by examining an issue that is relevant to public administration but also contributes to GST

generally. Specifically, this dissertation examines the joint effects of goal clarity and task criticality on performance. Before discussing the research design, this chapter presents hypotheses relative to goal clarity and task criticality.

Goal clarity

Organizational perspectives on goal clarity echo the individual-level assertions of GST. Evidence supports the claim that ambiguity in organizational goals is sometimes associated with performance disadvantages (Chun and Rainey 2005b). Early GST research tended to focus on the difficulty characteristics of goals but quickly learned that evidence failing to support the difficulty hypothesis—high levels of effort were associated with moderately difficult goals and low levels of effort were associated with both extremely difficult and extremely simple goals—could be attributed to a lack of clarity in goals (Hall & Foster, 1977; Hall & Hall, 1976). Field and laboratory evidence has shown that individuals working towards well specified goals out-performed themselves when they working with no goals or others who were encouraged to “do their best” (Dossett, Latham, & Mitchell, 1979; Ivancevich, 1976; Latham, Mitchell, & Dossett, 1978).

Early GST research continues to be helpful in explaining the ways in which clarity enhances performance. Terborg (1976) observed that

individuals working to achieve very specific goals tended to allocate more work time towards the specific micro-tasks related to their goals. Similarly, clearly specified goals help managers evaluate performance then render feedback (Sawyer, 1992) and help employees self-regulate effort (Latham and Locke 1991). These causal mechanism add to the general GST theory (Locke and Latham 2002; Locke et al.1980) which posits that clear, difficult goals lead to greater performance than no goals or imperatives to “do your best” though directing action (Locke et al 1970), enhancing effort (Kahneman, 1973; Latham & Locke, 1975), enhancing persistence (LaPorte & Nath, 1976) and stimulating strategy development and learning (Kolb & Boyatzis, 1970). Given the vast evidence presented here, it is hypothesized that higher levels of goal clarity are associated with greater levels of performance.

Hypotheses 1: Increases in goal clarity are associated with increases in performance.

Task criticality

To understand the relevance of task criticality to this study it is helpful to review the general GST perspective on task importance. In the context of GST, task importance is viewed primarily as a determinant of goal commitment (Locke and Latham 2002) and not as an independent moderator in goal achievement. Theory and research on the role of task importance in

goal achievement is generally limited to considerations of a small range of managerial approaches thought to increase goal commitment. Empirical evidence indicates that managerial behaviors such as having workers publicly commit to a goal (Hollenbeck, Williams, & Klein, 1989), leadership assignment of goals (Latham & Saari, 1979b; Ronan, Latham, & Kinne, 1973), and implementation of performance-contingent financial incentive mechanisms (Latham & Kinne, 1974; T. W. Lee, Locke, & Phan, 1997) all contribute to increases in goal achievement. Little attention is placed on the characteristics of the task or its anticipated outcomes as determinants of importance. This may be attributed, at least in part, to the subjective nature of task importance. What is important to one worker may not be important to others.

In the context of elusive proxies and subdimensions of task importance, the notion task criticality offers promise. Task criticality in the context of organizational research has been operationalized as the degree to which “failure in the task causes negative consequences” (Bower et al. 1994, 208). It is also hypothesized that the effects of task criticality on performance in the context of goal clarity will be the same as task importance. Specifically, task criticality will have a positive effect on performance and a positive joint effect with goal clarity on performance.

Hypotheses 2: Individuals working on critical tasks will perform better than individuals working on task that are not critical.

Hypothesis 3: The increases in performance associated with goal clarity are greater amongst individuals working on critical tasks than those not working on critical tasks.

Overview of present research

A 3x2 between group factorial design experiment is employed to test H1, H2 and H3. Experimental treatments include goal clarity (no stated goal, goal with low clarity, and goal with high clarity) and task criticality (task not critical and task critical). There are a total of six experimental treatment groups as show below in Table 4.1. Subjects (n=214) were randomly assigned to experimental treatment groups as outlined below.

Table 4.1—Experimental treatment conditions and treatment groups (number of subjects below in parenthesis)

| Goal clarity treatments | Task Criticality Treatments | |
|-------------------------|-----------------------------|-----------------|
| | Not Critical | Critical |
| No goal | Group 1 (control) (37) | Group 2 (37) |
| Low clarity | Group 3 (35) | Group 4 (34) |
| High clarity | Group 5 (36) | Group 6 (34) |

The central feature of the experiment was a task completion exercise. Such exercises are commonly used in management research (e.g. Jenkins et al. 1998) and becoming increasingly common in public administration (Bellé,

2013; Brewer & Brewer, 2011). The dependent variable, performance, is measured through multiple approaches so as to capture two primary dimensions of performance seen in task completion experiments, quantity and quality (Gilliland & Landis, 1992).

Experimental Treatments

The two experimental treatments are goal clarity (no goal, low goal clarity, and high goal clarity) and task criticality (no or yes). Before performing the previously mentioned task, subjects were required to read a set of instructions that contained multiple parts in the following order⁶ (see also Appendix A):

1. A statement about the project's objective
2. A set of precise instructions relative to performing the task
3. A statement about the subject's goal (unless the subject was randomly assigned to a treatment group that did not have a goal)

Of the three items mentioned above, only number 2, the instruction set, was held constant for all subjects. Item 1 included the text for the task criticality experimental treatment and item 3 included the text for the goal clarity experimental treatment.

⁶ Full instructions for each treatment group are provided in Appendix A.

Task criticality

The task criticality experimental treatment was implemented in the opening sentence of the instructions. Subjects in treatment groups without task criticality received the following statement about the study:

“About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project.”

Conversely, subjects assigned to treatment groups with task criticality received the following statement:

“About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project **related to relief from natural disasters.**”

These statements were included in bold and italicized text to set them off from the rest of the instructions and gather subjects' attention.

Goal clarity

The goal clarity treatment included three conditions with progressively increasing levels of clarity. The first condition included no reference to any goal. In this case, subjects were given only instructions relative to performing the task. The second condition, termed “low clarity,” provided a goal with low clarity. Specification of an unclear goal as one that encourages an individual to “do your best” is a commonly used operationalization of low goal clarity (Locke et al., 1990).

“Your Goal: You will be given 10 minutes to work. Your goal is to do your best working as quickly and accurately as possible”

Goal clarity can be increased through various forms of goal specification. The third condition, high clarity, includes the same imperative to “do your best” but adds a target specification and an evaluative specification for the goal. Target specification in the context of goal setting theory refers a component of a goal wherein a specific performance objective is stated (Chun & Rainey, 2005b). Specifically, subjects were given the following goal, including formatting as shown:

“Your Goal: You will be given 10 minutes to work. Your goal is to accurately transcribe as much information as possible. Your performance will be evaluated based on the number of individual form

fields you are able to accurately transcribe. On average, previous workers have been able to accurately transcribe 4 full forms. We encourage you to aim for this.”

This target, 4 full forms, was derived from the performance levels observed by pilot test subjects. Evaluative specification refers to the parameters under which satisfactory goal attainment is determined. In this case, subjects were told that, “performance will be evaluated based on the number of form fields they are able to accurately transcribe.”

Experimental task

Subjects were required to complete computer-enabled data transcription tasks. Each subject worked independently in one of twelve private work stations within the laboratory. Each station had the same type of computer, monitor and other hardware including a basic calculator.

The task involved transcribing information from digital images of forms that had been filled out by hand. Each form was the same but the information varied across images. There were a total of seven forms each including 10 fields. All subjects had 10 minutes to transcribe as much information as possible. A computer program displayed all seven images on the screen with fields below each image corresponding to the various portions

of the form to be transcribed. Pilot tests indicated that the most productive workers might be able to transcribe as much as 6 full forms but that the average person would transcribe fewer than 4. Picture 4.1 below provides an example of one form.

Form fields include alphanumeric number sets, phone numbers, partial addresses, names, and claim amounts. All the information used for populating the form fields was generated randomly using number, letter, name, city, and phone number generators. For most fields, subjects were required to transcribe information as it appeared on the image. Two fields (requested amount and approved amount) required subjects to add a set of values together and report their sum.

Picture 4.1. Sample image of form used for the data transcription task

| Form 79-0712 | | | |
|-----------------------------------|--------------------------------|-------------------|------------------|
| Requestor Information | | | |
| IDN: | Date: | | |
| J33T23F2T2Z5K694 | 9/19/2008 | | |
| Requestor name (last, first, mi): | Requestor Address (City, Zip): | Requestor phone: | |
| Puckett, Karren, U | Follett, 57678 | (833)099-6342 | |
| Field Office Information | | | |
| Contact EID: | Contact phone: | Requested amount: | Approved amount: |
| 2JW6695223 | ex 80898 | 1. \$ 51,928 | 1. \$ 46,215.92 |
| | | 2. \$ 27,327 | 2. \$ 24,321.00 |
| | | 3. \$ 41,154 | 3. \$ 36,627.06 |
| | | 4. \$ 47,779 | 4. \$ 42,523.31 |
| Req. Code | | | |
| 2726F336 | | | |

Relatively little attention is placed on low and entry-level workers in public administration research. Rather, managers and supervisors tend to be the focus of survey and field research. Seeing this as an opportunity, a special emphasis was placed on developing a task that is relevant to the entry-level worker. Specifically, the task was designed to involve a high frequency of low to moderately difficult micro-tasks.

Subjects

The subject pool for this study is comprised of 214 undergraduate college students from the University of Georgia. Subjects' mean age is 20.3 years and ranges from eighteen to thirty-six though only six subjects were over the age of twenty-three. Forty-three subjects (approximately 20 percent) reported majoring in engineering or the sciences. Those remaining reported majors in business, social sciences or humanities. The number of years in college ranges from less than one to five. Seventy-four of the subjects (34.6 percent) were male. A large majority of subjects spoke English as their native language (86.5 percent) and reported their race or ethnicity as white or Caucasian (65.9 percent). The majority of non-white students were Asian (20.1 percent). Approximately thirty-nine percent of the subjects were employed at least part-time. Table 4.2 provides the subjects' demographics.

Table 4.2—Subject demographic characteristics

| Variable | Count | Mean | SD | Min | Max |
|---------------------------------|--------------|-------------|-----------|------------|------------|
| White | 141 | 0.66 | 0.48 | 0 | 1 |
| Asian | 24 | 0.11 | 0.31 | 0 | 1 |
| Hispanic | 15 | 0.07 | 0.25 | 0 | 1 |
| Asian | 43 | 0.20 | 0.40 | 0 | 1 |
| Native American | 0 | 0.00 | 0.07 | 0 | 1 |
| Pacific Islander | 2 | 0.01 | 0.10 | 0 | 1 |
| Currently employed | 83 | 0.39 | 0.49 | 0 | 1 |
| Hours worked per week | - | 2.23 | 42.52 | 0 | 55 |
| Majoring in science/engineering | 43 | 0.20 | 0.40 | 0 | 1 |
| Native English speaker | 184 | 0.86 | 0.34 | 0 | 1 |
| Age (years) | - | 20.30 | 1.86 | 18 | 36 |
| Years in college | - | 2.58 | 1.14 | 0.5 | 5 |

Recruitment, Deception and Incentives

Subjects were recruited by email under the pretense that they would be helping university researchers “assess their labor needs for an upcoming project.” This deception was approved by the university institutional review board (IRB) and subjects were debriefed as to the true nature of the study upon completion of the task. Subjects were provided the opportunity to opt-out of the study upon being debriefed. No subjects selected to do so. Subjects were offered \$15 as payment for their work.

The study was conducted on four consecutive days in March 2013. Subjects scheduled appointment times to participate in the project. Upon arriving at the lab subjects were escorted to work stations where a computer displayed a set of instructions. Subjects were told by the researchers that the instructions provided complete information relative to their work and that the researchers managing the project had no additional information to provide. Under these conditions no subjects asked for further clarification on the nature of the task, its criticality or the details of their assigned goals. Thus, there was little likelihood of contamination effects associated with unintended information asymmetries associated with interaction communication with the researchers.

Performance Measurement

Task performance experiments often measure performance along two primary dimensions: performance quantity and performance accuracy (for an example specific to goal achievement see Gilliland and Landis (1992)). This study follows this tradition by assessing performance along multiple dimensions. Performance quantity is the number of items the subject attempted to transcribe. Each form has a total of 10 items. Since there are a total of 7 forms there are a maximum of 70 items to transcribe. A subject is given credit for each item that is completed irrespective of accuracy. Performance accuracy is the number of items transcribed accurately.⁷

⁷ Greater detail on the full spectrum of performance measurements observed in this experiment is provided in Appendix B.

CHAPTER 5

RESULTS

Observed performance quantity scores range from 18 to 68 and have a mean of 36.18 (SD = of 8.8). Observed scores for performance accuracy range from 11 to 64 and a mean of 32.56 (SD = 9.0). Table 5.1 provides the mean values of performance quantity and accuracy for each experimental treatment group.

Table 5.1—Performance quantity and performance accuracy means by treatment group (standard deviation in parenthesis)

| Goal clarity treatments | Performance Quantity | | Performance Accuracy | |
|-------------------------|----------------------|---------------|----------------------|---------------|
| | Task Criticality | | Task Criticality | |
| | Treatments | | Treatments | |
| | Not Critical | Critical | Not Critical | Critical |
| No goal | 33.9 (6.8) | 33.8 (6.7) | 31.1 (6.7) | 30.2 (6.2) |
| Low clarity | 35.7 (9.8) | 36.3 (8.6) | 32.2 (9.9) | 32.3 (9.4) |
| High clarity | 40.7 (11.0) | 36.8 (7.9) | 37.0 (12.0) | 32.7 (7.6) |

The results displayed in Table 5.1 indicate that performance increases with greater levels of goal clarity. The highest levels of performance are associated with the highest levels of goal clarity. A two-way ANOVA indicates the treatment effect of goal clarity is statistically significant for performance quantity ($F(2, 212) = 5.92, p = 0.003$) and performance accuracy

($F(2, 212) = 4.18, p = 0.017$). Results suggest that there is little or no benefit to task criticality when there is no goal or when the goal is not clear. When the goal is highly specified, individuals receiving the criticality treatment performed notably worse than those not receiving the treatment. The two-way ANOVA indicates that the main effect of task criticality is not statistically significant. The same test indicates that the two-way interaction of goal clarity and task criticality experimental treatments is also lacking statistical significance. The results of the two-way ANOVA for performance quantity and accuracy are provided in Table 5.2.

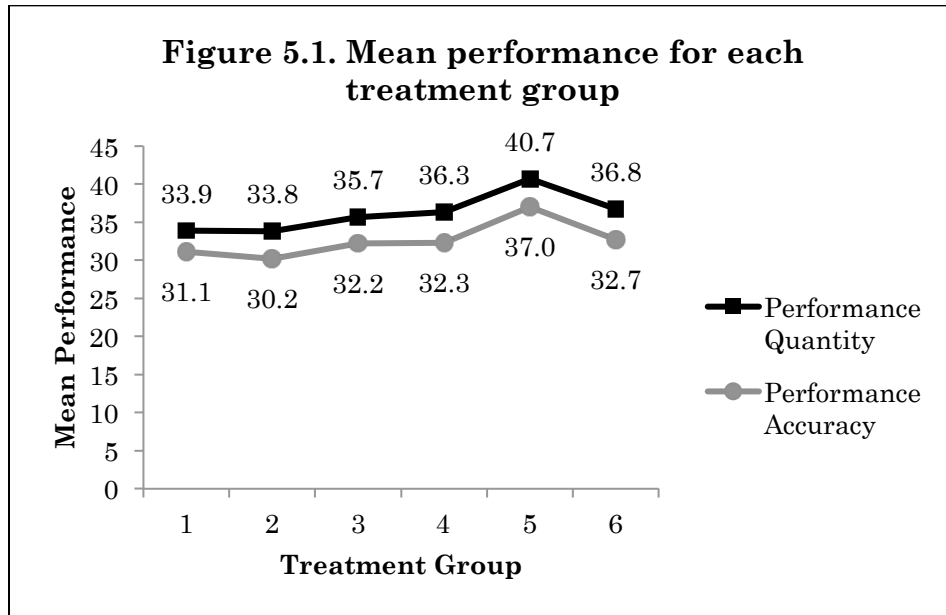
Table 5.2—Two-way ANOVA of performance quantity and accuracy in goal clarity and task criticality treatment groups (F-statistics).

| | Performance Quantity | Performance Accuracy |
|------------------------------------|-------------------------|-------------------------|
| Test of goal clarity treatment | 5.92*** | 4.18** |
| Test of task criticality treatment | 0.91 | 1.91 |
| Test of treatment interaction | 1.36 | 1.24 |
| R-squared | 0.0574 | 0.0468 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This evidence supports H1, that goal clarity is associated with higher levels of performance. The ANOVA results fail to provide evidence of any effect associated with task criticality. However, that is not to say that there is no effect. The ANOVA fails to account for the fact that while there is little or no effect of task criticality in the “no goal” and “low clarity” treatments, there appears to be an effect in the “high clarity” treatments (groups 5 and 6).

Figure 5.1 provides a plot of the mean performance quantity and performance accuracy for each treatment group. The substantial drop in mean performances from group 5 to group 6 suggests a negative effect of task criticality when goal clarity is high, which is inconsistent with H2 and H3.



OLS predictions of performance quantity and accuracy help further examine the effects of task criticality in treatment groups 5 and 6. Results are presented in Table 5.3. Models 1 and 2 provide predictions that use treatment groups 2 through 6 as regressors, as indicated by TG2-TG6 in parenthesis next to each variable label in the left-hand column. The control group (group 1) is excluded as a regressor. The value of the constant is the same as the mean value of the dependent variable for group 1 in each model. The beta-coefficients in this case are the average difference between the

mean performances of the control group (group 1) and the performances in each respective treatment groups.

Models 3 and 4 include additional controls for a number of subject traits potentially associated with experience, attitudes towards work or ability. These traits include gender (a dummy variable set to 1 if male), experience as a student (count of the number of years in college and a restriction of the sample to those who have been in college for at least one year), English fluency (a dummy variable set to 1 for native English speakers), race or ethnicity (dummy variables set to 1 for white and Asian students), employment status (a dummy variable set to 1 if currently employed) and likelihood that school work requires routine technical work on computers (a dummy variable set to 1 if majoring in the sciences or engineering). GST suggests that controlling for such characteristics may be called for. According to Locke and Latham (2002, 707), "when confronted with task goals, people automatically use the knowledge and skills they have already acquired that are relevant to goal attainment." The control variables presented—especially age, being a science or engineering major, employment experience, years in college and language fluency—have some bearing on knowledge and skills already acquired.

Table 5.3—OLS Predictions of performance quantity and accuracy

| | Model 1 | Model 2 | Model 3 | Model 4 |
|------------------------------------|----------------------|----------------------|----------------------|----------------------|
| | Quantity | Accuracy | Quantity | Accuracy |
| | beta | beta | beta | beta |
| | Robust SE | Robust SE | Robust SE | Robust SE |
| No goal + task critical (TG 2) | -0.108 (1.995) | -0.811 (2.054) | 0.805 (1.599) | 0.161 (1.559) |
| Low clarity (TG 3) | 1.795 (2.023) | 1.117 (2.083) | 2.600 (1.883) | 2.065 (1.901) |
| Low clarity + task critical (TG 4) | 2.375 (2.038) | 1.240 (2.099) | 2.827 (1.839) | 1.836 (2.026) |
| High clarity (TG 5) | 6.748*** (2.009) | 5.946*** (2.068) | 7.990*** (2.016) | 6.938*** (2.165) |
| No goal + task critical (TG 6) | 2.910 (2.023) | 1.632 (2.083) | 4.601*** (1.757) | 3.354* (1.780) |
| Male | - | - | -0.233 (1.163) | 0.028 (1.222) |
| Years in college | - | - | 1.214** (0.596) | 1.231** (0.610) |
| Native English speaking | - | - | 1.641 (1.779) | 0.850 (2.055) |
| White | - | - | 0.845 (1.404) | 1.685 (1.579) |
| Asian | - | - | 6.452*** (1.610) | 5.410*** (1.827) |
| Employed | - | - | 3.706*** (1.235) | 3.195** (1.275) |
| Science/Engineer major | - | - | 2.789* (1.541) | 3.387** (1.586) |
| Constant | 33.919*** (1.411) | 31.054*** (1.452) | 24.737*** (2.758) | 22.141*** (3.025) |
| Observations | 214 | 214 | 214 | 214 |
| R-squared | 0.070 | 0.058 | 0.215 | 0.173 |

* p<0.10, ** p<0.05, *** p<0.01

The multivariate predictions from models 1 and 2 support the findings from the ANOVA but reveal more on the statistical significance at high goal clarity levels. There is a positive effect associated with goal clarity with the greatest benefits seen at the highest level of clarity. This is statistically significant (p<0.01) for both performance quantity and accuracy. There is no statistically significant effect of task criticality in models 1 and 2. After

controlling for personal traits, the effect of task criticality is negative and statistically significant when clarity is high ($p > 0.01$ for performance quantity and $p > 0.1$ for performance accuracy). The coefficients for performance quantity drop from 7.9 to 4.6 and from 6.9 to 3.3 for performance accuracy when the task critically treatment is added to a highly specified goal.

CHAPTER 6

DISCUSSION AND CONCLUSION

The results of this 3x2 factorial design laboratory experiment indicate a task performance benefit is associated with goal clarity. Instructions including a vaguely specified and easily attainable goal are associated with higher task performance than instructions with no goal at all. Instructions with clearly specified goals including target and evaluative specifications are associated with greater task performance benefits than instructions with vaguely specified goals. Findings relative to goal clarity are consistent with the findings of previous studies and support H1, that increases in goal clarity are associated with increases in task performance.

Following the trend in research on task importance (Locke et al., 1990) and task significance (Grant 2008), H2 states that task criticality is associated with increases in task performance. Results provide no evidence to support H2. H3 states that task criticality will have a positive mediating factorial effect on the performance benefits of goal clarity. There is also no evidence to support H3. Conversely, there is some evidence to support the opposite. The joint effect of task criticality and high goal clarity is much smaller than high goal clarity alone. This is statistically significant ($p > 0.01$ for performance quantity and $p > 0.10$ for performance accuracy). There is no

statistically significant difference in mean performance levels associated with task criticality in groups with no goal or with vaguely specified goals.

A post-test questionnaire indicates that the design of this treatment was effective in manipulating subjects' perception of task criticality. Subjects were asked to agree or disagree with the statement, "the task addressed a critical issue." The mean response of a scale of 1 to 7 was 3.6 for those without the treatment and 4.2 for those with the treatment. The difference in means is statistically significant at the 0.01 level. This difference is smaller than would be expected but the directionality and statistical significance provide sufficient evidence to indicate that the manipulation was effective. Thus, it is unlikely that the failure to support H2 and H3 can be attribute solely to a weakness in the experimental treatment.

The findings on task criticality are unexpected but not unexplainable. In an attempt explain how work perceived as highly important can either enhance or reduce performance, Cavanaugh and colleagues (2000) introduce the notion of work "challenge-stressors." Challenge-stressors may on one hand enhance engagement, focus, effort and involvement resulting in increased performance. On the other hand, a challenge-stressor may enhance stress, uncertainty or risk of failure resulting in decreased performance. The findings relative to task criticality add to the "challenge-stressor" view of task importance by highlighting a subdimension of importance, criticality, which may be associated with lower task performance. This study does not assess

the level of stress or discomfort associated with performing the task but this is seen as an opportunity for future research. More importantly, these findings underscore the imperative in GST research to think more specifically about what is meant by task importance. Task importance is a broad concept and its effects on performance are not universal.

The evidence indicates that increases in goal clarity are associated with increases in task performance. However, when highly specified goals are implemented in the context of critical tasks the performance benefits of goal clarity are greatly reduced. This suggests that there are some highly critical tasks, such as those related to natural disaster relief, which may be performed well under conditions of goal vagueness (notice that the performance accuracy levels of groups 3, 4 and 6 are very similar).

It is important to note that the findings of this experiment are not specific to the public sector. However, they can be extended to a discussion of relevance to the public sector. Public organizations are often characterized as suffering from insufficient goal clarity (Chun & Rainey, 2005a). It is true that public organizations often pursue broad-aim programs where goals are hard to specify (Weiss & Rein, 1970) but work is critical. Under these conditions, goal-setting theories and related rhetoric are sometimes invoked in calls for reform (Kettl 2000). Such calls view increasing goal clarity as an easy solution to a variety of organizational problems (Ordóñez et al., 2009). Yet the reality is much more complex.

In this sense, seeking to understand how individuals work successfully in environments with ambiguous goals may be a more valuable pursuit than efforts to reduce goal ambiguity. This is similar to the view of Pandey and Wright who argue that too much attention is placed on the benefits of goal clarity and too little attention on the qualities of managers that enable them to cope with ambiguity (2006, 512).

Strengths and Limitations of the Present Study

A strength of this study is the focus on entry-level routine work. Routine work has been overlooked in organizational studies (including management and economics) for decades (Rotchford & Roberts, 1982). This is a problem because individuals who perform routine tasks (largely part-time and entry-level employees) constitute a large part of the labor force and often occupy important organizational roles.

A limitation of this study is that its performance measures are time dependent. GST asserts that clear goals increase persistence (LaPorte and Nath 1976) and empirical evidence suggests that goal and task characteristics influence time allocation (Strickland & Galimba, 2001). The present study indicates that individuals working on critical tasks do less in the same amount of time as those working on non-critical tasks. This study does not provide subjects the opportunity to manifest their persistence

through time expending the amount of time they allocate to the task. Thus, it is reasonable to assume that task criticality increases persistence but it is difficult to assess this in the context of the present study. Following completion of the task but before being debriefed, subjects were asked to respond to a questionnaire that asked to indicate the extent to which they agree or disagree (on a 7-point Likert scale) with the following question: “I am interested in doing more work like this.” The mean response for individuals in the task criticality treatment was 4.4 (SD=0.18, n=106) and 4.0 (SD=0.19, n=108) for those not receiving this treatment. The difference in these means is not statistically significant, providing some evidence that willingness to continue working past the time limit does not change if the task is critical or not. Still, the issue of persistence and time allocation is worthy of further consideration.

A second limitation of this study is the assessment of stress or anxiety. The challenge-stressor view of work importance (Cavanaugh 2000) is the primary explanation of the findings that (1) task critical does not increase performance and (2) task criticality sometimes decreases performance. To appropriately examine the validity of this explanation future research must provide an assessment of the stress associated with performing critical and not critical tasks.

Future Research

There are presently a number of opportunities facing this research that capitalize on data that has already been collected or data that can be collected relatively easily. Consider first the data that can be collected relatively easily.

As noted in Chapter 3, Internet survey research has become increasingly conducive to experimental inquiry. Many routine economic, managerial and other human interactions have moved to the Internet. Social scientists have long considered the potential to conduct laboratory experiments on the internet (for example, see: Birnbaum, 2000; Ma & Nickerson, 2006; Shen et al., 1999). Recent literature has seen increasingly creative implementation of classic laboratory studies on the internet, including studies of decision making and collaboration (Edelman, 2012) and the notion of the “remote laboratory” has been proffered as lens for experimentation (Ma & Nickerson, 2006). A special emphasis was placed on designing this experiment so that it could be implemented over the Internet. Plans have been made to implement another phase of this study using a sample of mechanical turks provide through Quattrics, a sample sources that has been used successfully by other management researchers (for example, see: Rosoff, John, & Prager, 2012; Strauss, Griffin, & Parker, 2012). This future implementation will seek to build upon the present study by assessing

subjects' stress levels and, perhaps, considering a more dramatic context through which to manipulate task criticality.⁸

Turn now to research opportunities associated with data that has already been collected. As mentioned previously, subjects were asked to respond to a questionnaire following completion of the task. Subjects were told only that the questionnaire related to their experiences performing the task and their attitudes towards work in general. Locke and Latham (2002) have noted that an important knowledge gap surrounding personality exists in GST research. With this in mind the post-test questionnaire included several items related to personality and motivation. These questions were derived from scales used in the literature including bureaucratic orientation (Gordon, 1970), bureaucratic personality (Bozeman and Rainey 1998), public service motivation (Perry, 1996), and the personal need for structure (Neuberg & Newsom, 1993).⁹ Future research will use these data to assess the extent to which certain personality traits moderate the effectiveness of goal clarity.

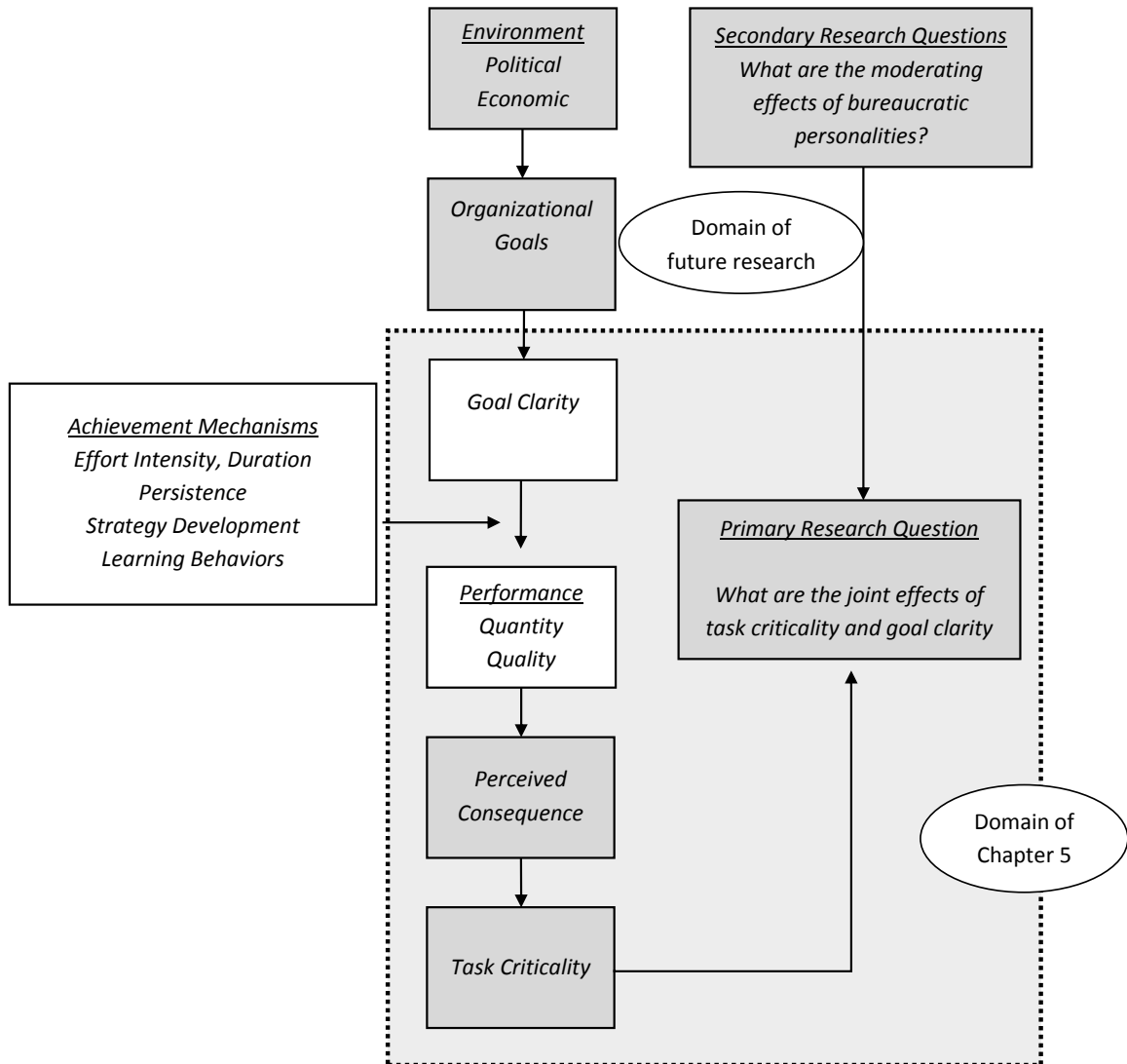
In closing, goals play an important role in public management theory and practice. Despite having been examined for decades, there is still much to be learned about this important role. Figure 6.1 illustrates how this study

⁸ I would like to adopt a task related to organ donation but understand that the IRB may have some reservations with such a deception. The objective here is to incite a challenge-stressor response not long-term emotional discomfort.

⁹ These questions and their descriptive statistics are listed in Appendix C.

(the results presented in Chapter 5) and the proposed future research contribute to goal setting theory.

Figure 6.1—Primary and secondary research programs and integration with a public administration perspective on GST



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APPENDIX A

EXPERIMENTAL TASK INSTRUCTIONS

INSTRUCTIONS FOR TREATMENT GROUP 1 (Control Group)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

INSTRUCTIONS FOR TREATMENT GROUP 2 (No goal, task critical)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project related to relief from natural disasters.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

INSTRUCTIONS FOR TREATMENT GROUP 3 (low clarity, task not critical)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Your Goal: You will be given 10 minutes to work. Your goal is to do your best working as quickly and accurately as possible.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

INSTRUCTIONS FOR TREATMENT GROUP 4 (low clarity, task critical)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project related to relief from natural disasters.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Your Goal: You will be given 10 minutes to work. Your goal is to do your best working as quickly and accurately as possible.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

INSTRUCTIONS FOR TREATMENT GROUP 5 (high clarity, task not critical)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Your Goal for Section One: You will be given 10 minutes to work. Your goal is to accurately transcribe as much information as possible. Your performance will be evaluated based on the number of individual form fields you are able to accurately transcribe. On average, previous workers have been able to accurately transcribe 4 full forms. We encourage you to aim for this.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

INSTRUCTIONS FOR TREATMENT GROUP 6 (high clarity, task critical)

Project Overview

Please read the following instructions completely and carefully before continuing.

About this study: Your participation is helping a group of UGA researchers assess their labor needs for an upcoming project related to relief from natural disasters.

No talking: The study has now begun. We ask that you refrain from talking or otherwise communicating with others (with the exception of the researcher) until you have been notified that the study is complete. If you have a technical problem, please raise your hand and a research will come assist you.

Instructions for Section One: Section One includes a single page with images of several forms. Each form has been filled out by hand. While every form is the same, the information on each form is different. There are 10 boxes on each form. Below each image is a set of fields that correspond to the forms' boxes. Please transcribe the information from each form into the appropriate boxes below each image.

There are two fields that include lists of dollar amounts ("Requested Amount" and "Approved Amount"). For each of these fields please provide the sum of these amounts in the space provided. You may use the calculator to figure these amounts.

Your Goal for Section One: You will be given 10 minutes to work. Your goal is to accurately transcribe as much information as possible. Your performance will be evaluated based on the number of individual form fields you are able to accurately transcribe. On average, previous workers have been able to accurately transcribe 4 full forms. We encourage you to aim for this.

Instructions for Section Two: The computer is set to automatically advance you to Section Two when the time arrives. **Section Two** includes several questions about yourself and your experience performing this task. Please respond to these questions and let a researcher know when you are finished.

APPENDIX B

PRIMARY AND SECONDARY MEASURES OF PERFORMANCE

Task performance experiments often measure performance along two primary dimensions: performance quantity and performance accuracy (for an example specific to goal achievement see Gilliland and Landis 1992). This study follows this tradition by assessing performance along multiple dimensions.

Performance quantity is the number of items the subject attempted to transcribe. Each form has a total of 10 items. Since there are a total of 7 forms there are a maximum of 70 items to transcribe. A subject is given credit for each item that is completed irrespective of accuracy. Performance accuracy is the number of items transcribed accurately.

Related measures of performance accuracy are also observed, however, these are not used in the study presented in Chapter 5. Punctuation performance refers to the number of items wherein a subject accurately transcribes all the field information including the punctuation marks as they are presented on the forms. For example, a subject receives punctuation performance credit if he or she includes parenthesis around the phone number's area code and places a hyphen in the appropriate location before the last four digits.

Case sensitivity performance measures the extent to which the subject accurately transcribed information using the case sensitivity presented on the form. For example, a subject would receive credit for capitalizing the name of the city in the address field.

A final measure assessed the extent to which subjects followed directions carefully. The instructions for transcription of names asked that subjects provide names in the following order: first name, middle initial, and then last name. However, the forms provided names in a different order: last name, first name, and then middle initial. No special attention was placed on this portion of the instructions. Rather, subjects were asked to read over the instructions carefully.

Only performance quantity and performance accuracy are used as dependent variables in Chapter 5. Tables 4.3, 4.4 and 4.5 provide these performance levels as measured by the means per treatment group.

Table B.1—Performance quantity and performance accuracy means by treatment condition (standard deviation in italics)

| Goal clarity treatments | Performance Quantity | | Performance Accuracy | |
|-------------------------|-----------------------|----------------------|-----------------------|----------------------|
| | Task Criticality | | Task Criticality | |
| | Not Critical | Critical | Not Critical | Critical |
| No goal | 33.9 <i>(6.8)</i> | 33.8 <i>(6.7)</i> | 31.1 <i>(6.7)</i> | 30.2 <i>(6.2)</i> |
| Low clarity | 35.7 <i>(9.8)</i> | 36.3 <i>(8.6)</i> | 32.2 <i>(9.9)</i> | 32.3 <i>(9.4)</i> |
| High clarity | 40.7 <i>(11.0)</i> | 36.8 <i>(7.9)</i> | 37.0 <i>(12.0)</i> | 32.7 <i>(7.6)</i> |

Table B.2--Performance case and performance punctuation means by treatment group (standard deviation in italics)

| Goal clarity treatments | Performance Case | | Performance Punctuation | |
|-------------------------|-----------------------------|------------------------|-----------------------------|------------------------|
| | Task Criticality Treatments | | Task Criticality Treatments | |
| | Not Critical | Critical | Not Critical | Critical |
| No goal | 19.30 <i>(4.71)</i> | 19.78 <i>(4.14)</i> | 11.89 <i>(4.21)</i> | 11.51 <i>(4.44)</i> |
| Low clarity | 20.89 <i>(5.89)</i> | 20.00 <i>(5.62)</i> | 12.77 <i>(3.80)</i> | 11.53 <i>(4.33)</i> |
| High clarity | 23.08 <i>(6.87)</i> | 20.43 <i>(5.01)</i> | 13.19 <i>(5.14)</i> | 11.86 <i>(4.03)</i> |

Table B.3--Mean number of names transcribed properly by treatment group (standard deviation in italics)

| Goal clarity treatments | Following directions | |
|-------------------------|-----------------------------|-----------------------|
| | Task Criticality Treatments | |
| | Not Critical | Critical |
| No goal | 2.05 <i>(1.82)</i> | 2.16 <i>(1.74)</i> |
| Low clarity | 2.54 <i>(2.03)</i> | 1.82 <i>(1.98)</i> |
| High clarity | 2.31 <i>(2.27)</i> | 2.69 <i>(1.92)</i> |

APPENDIX C

DESCRIPTIVE STATISTICS FROM POST-TEST QUESTIONNAIRE

All responses, unless otherwise indicated, are to a 7-point Likert scale where 1 is strongly disagree and 7 is strongly agree

Questions about the experience and the task

| Variable | Mean | SD | Min | Max |
|--|------|----|-----|-----|
| The task I was required to do was clearly explained to me | 6.2 | 1 | 1 | 7 |
| The goal I was asked to pursue was attainable | 5.4 | 2 | 1 | 7 |
| I feel satisfied with my performance on this task | 4.8 | 2 | 1 | 7 |
| I am interested in doing more work like this | 4.2 | 2 | 1 | 7 |
| This task addressed a critical issue | 3.9 | 1 | 1 | 7 |
| I found performing the task to be an unpleasant experience | 3.6 | 2 | 1 | 7 |
| I was able to accomplish my goal(s) for this task | 3.8 | 2 | 1 | 7 |
| The importance of this task was clearly explained to me | 3.4 | 2 | 1 | 7 |
| I felt it was important for me to perform well on this task | 5.2 | 1 | 1 | 7 |
| I anticipate that my performance today may lead to job opportunities in the future | 3.9 | 2 | 1 | 7 |
| It is important that I impress the researchers performing this study | 3.9 | 2 | 1 | 7 |

Personal Need for Structure

(responses to a 5-point Likert scale where 1 is strongly disagree and 5 is strongly agree)

| Variable | Mean | SD | Min | Max |
|---|------|------|-----|-----|
| It upsets me to go into a situation without knowing what I can expect from it | 3.4 | 0.98 | 1 | 5 |
| I'm not bothered by things that interrupt my daily routine | 3.1 | 1.04 | 1 | 5 |
| I enjoy having a clear and structured mode of life | 3.7 | 0.91 | 1 | 5 |
| I like to have a place for everything and everything in its place | 3.5 | 1.00 | 1 | 5 |
| I find that a well-ordered life with regular hours makes life tedious | 3.1 | 1.00 | 1 | 5 |
| I don't like situations that are uncertain | 3.3 | 1.02 | 1 | 5 |
| I hate to change my plans at the last minute | 3.3 | 1.13 | 1 | 5 |
| I hate to be with people who are unpredictable | 2.7 | 1.03 | 1 | 5 |
| I find that a consistent routine enables me to enjoy life more | 3.1 | 0.93 | 1 | 5 |
| I enjoy the exhilaration of being in unpredictable situations | 3.5 | 0.93 | 1 | 5 |
| I become uncomfortable when the rules in a situation are not clear | 3.4 | 0.98 | 1 | 5 |
| I enjoy being spontaneous | 3.9 | 0.83 | 1 | 5 |

Bureaucratic Orientation

| Variable | Mean | SD | Min | Max |
|---|------|----|-----|-----|
| A superior should expect subordinates to carry out his orders without question | 4.2 | 2 | 1 | 7 |
| A person should not volunteer opinions to his superior outside of his own area | 3.2 | 2 | 1 | 7 |
| Formality, based on rank or position, should be maintained by members of an.. | 4.8 | 1 | 1 | 7 |
| People are better off when the organization provides a complete set of rules to | 5.1 | 1 | 1 | 7 |
| Length of service in an organization should be given almost as much recognition | 4.1 | 2 | 1 | 7 |

Work involvement

| Variable | Mean | SD | Min | Max |
|---|------|----|-----|-----|
| A job should mean more to a person than just money | 6.3 | 1 | 3 | 7 |
| People should be highly interested in their work | 6.3 | 1 | 4 | 7 |
| Most of the satisfaction in a person's life should come from work | 3.8 | 1 | 1 | 7 |

Alienation

| Variable | Mean | SD | Min | Max |
|--|------|----|-----|-----|
| Often when I interact with others I feel insecure over the outcome | 3.2 | 2 | 1 | 7 |
| I feel no need to try my best at work or school for it makes no difference anyways | 1.5 | 1 | 1 | 6 |
| No matter how hard I try my efforts will accomplish nothing | 1.5 | 1 | 1 | 5 |

Pessimism

| Variable | Mean | SD | Min | Max |
|--|------|----|-----|-----|
| Many people are friendly only because they want something from you | 3.3 | 2 | 1 | 7 |
| The future looks bleak | 2.2 | 1 | 1 | 7 |
| People generally protect their own interests above all else | 5.1 | 1 | 1 | 7 |

Public Service Motivation

| Variable | Mean | SD | Min | Max |
|--|------|----|-----|-----|
| Meaningful public service is very important to me | 6.1 | 1 | 2 | 7 |
| I am often reminded by daily events about how dependent we are on one another | 5.6 | 1 | 1 | 7 |
| Making a difference in society means more to me than personal achievements | 5.4 | 1 | 2 | 7 |
| I am prepared to make enormous sacrifices for the good of society | 4.6 | 2 | 1 | 7 |
| I am not afraid to go to bat for the rights of others even if it means I will be.. | 5.3 | 1 | 1 | 7 |