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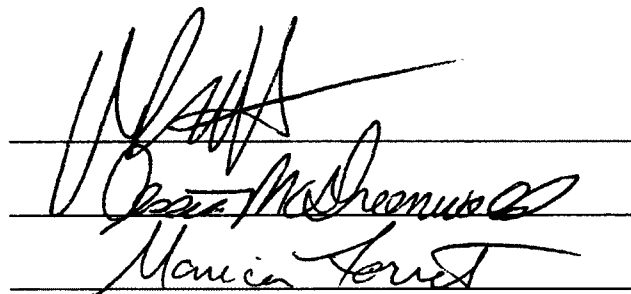
The undersigned, approved by the Doctoral Faculty Council, have examined the dissertation entitled

SAME GOAL, DIFFERENT DAY: THE MODERATING EFFECT OF EXPERIENCE
ON THE GOAL DIFFICULTY – PERFORMANCE RELATIONSHIP IN A
REPETITIVE GOAL SETTING ENVIRONMENT

presented by James F. Graham

a candidate for the degree of Doctor of Business Administration

And hereby certify in their opinion it is worthy of acceptance.



The image shows three handwritten signatures, each written on a horizontal line. The top signature is the most stylized and difficult to decipher. The middle signature appears to be 'Chris McShannon'. The bottom signature is 'Maurice Ferris'.

**Same Goal, Different Day: The Moderating Effect of Experience on the Goal
Difficulty – Performance Relationship in a Repetitive Goal Setting Environment**

A Dissertation
presented to
the Doctoral Faculty Council of
St. Ambrose University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Business Administration

By
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May 2012

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ABSTRACT

Goal theory has existed for many years. It has received wide study in academia and has become a large part of practitioner efforts to improve organizational performance. In all cases, goal setting has resulted in better organizational performance than its counter philosophy of “do your best”. With the demands on organizations to outperform their past experience, compete globally, and be competitive in an uncertain environment, it has never been more important for organizations to focus their efforts in the most effective way possible. Much research has been devoted to the many aspects of goal theory: self-set versus assigned, hard versus easy, group versus individual. One aspect that has not received much attention has been the effect of past experience on a group or individual’s acceptance of the goal and the repetitive goal usage. Given the prevalence of repetitive – daily, weekly, monthly, or annual goals – in the workplace, this issue is of critical importance. Using archival production records from a small, mid-west manufacturing firm, regression analysis was used to test hypotheses for effects of goal difficulty and past experience as well as their interaction on current performance. All models were found to be statistically significant, explaining up to 68% of the variance in current performance.

As previously tested and supported in other research, difficult goals are positively associated with task performance. Contrary to previous testing, past experience was not a significant predictor of current performance. While the interaction of goal difficulty and past experience was statistically significant, the result was in a direction opposite to prediction, failing to support the initial hypothesis. These failures are attributed to statistical difficulties in the analysis arising from several factors encountered with the

field study and the use of archival data. These included the operationalization and measuring of goal difficulty, accounting for the use of repetitive goals prior to the period of this study's observation and the potential effect of streamlined operations through lean manufacturing principles in combination with repetitive goal setting which possibly created a ceiling effect on impact of setting hard goals. These challenges and statistical results are discussed. Implications of the findings and directions for future research are presented.

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Same Goal, Different Day: The Moderating Effect of Experience on the Goal Difficulty – Performance Relationship in a Repetitive Goal Setting Environment

Many organizations are striving to improve performance, and goal setting has proven extremely effective in accomplishing the objective (Pritchard, Roth, Jones, Galgay, & Watson, 1988). The theory of goal setting has been rated first in importance among 73 management theories by organizational behavior scholars (Miner, 2003). The relationship between goals and performance has been demonstrated in the laboratory and in field settings across an impressive array of tasks, settings, and cultures (Latham & Locke, 2006). Goal setting theory has been widely used by practitioners to affect organizational performance. For instance, scholars developed programs of “Management by Objectives” (e.g., Tosi & Carroll, 1968, 1973) to use knowledge from goal theory in the systematic control and improvement of worker performance. Mitchell & Daniels (2003) concluded that it is the single most dominant theory in management study, with over a thousand articles and reviews published on the topic in little over 30 years (Latham & Pinder, 2005).

Despite the wealth of information about the effectiveness of goal setting, applying it in the workplace is complicated; overconfidence in and overreliance on goal setting theory has been strongly criticized in recent literature (Ordoñez, Schweitzer, Galinsky, & Bazerman, 2009a, 2009b). One especially relevant criticism centers on the interpretation of the theory’s prescription for goal setting. The kind of goals prescribed by theory for maximum performance have been described as challenging but not impossible (Latham & Locke, 1991). The reasoning for this prescription is that goals that are too difficult can

result in reduced commitment (Erez & Zidon, 1984) or outright rejection (Stedry & Kay, 1966). A lack of commitment, in turn, makes goals less effective – it weakens the goal difficulty-performance relationship (Klein, Wesson, Hollenbeck, & Alge, 1999).

Questions remain about exactly whose perception of difficulty matters, and what level of difficulty fills the requirements of a just-right prescription.

Applying knowledge from goal theory and its empirical findings is especially challenging in a workplace setting because typical workplace contexts have unique features. First, in a typical workplace, goals are set repetitively and in a regular cycle. Goals are set, for instance, for monthly sales, or a length of time without lost-time injuries. When the cycle ends, a new goal is set and performance begins again. This is in contrast to typical laboratory settings (e.g., Locke, 1968; see Locke & Latham, 1990), in which a single goal-performance cycle is observed. Even in longitudinal field research, goals have been set at a static level, and the effects observed over some period of time (e.g., Latham & Baldes, 1975). Second, workplaces are characterized by work groups that have various levels of training and experience, as well as a track record of experience that provides convincing evidence of expected performance. While less at odds with field studies (Latham & Yukl, 1975), this is quite different from laboratory studies that use unfamiliar tasks like brainstorming uses for a rubber tire (Ilies & Judge, 2005).

Striving for goals that are challenging, but not too difficult has lead to a wide range of implementation practices. In the laboratory, for relatively novel tasks, a goal that is expected to have a success rate of 10% has become a standard (Erez & Zidon, 1984; Knight, Durham, & Locke, 2001). Among practitioners, goals are typically set to be more attainable. For instance, Zoltners, Sinha, and Lorimer (2006) asked members of the

Incentive Compensation Advisory Board of the American Management Association “what percent of the sales force do you think should make goal?” They reported that responses were “evenly spread across a range from 50 to 80 percent” (p. 320). Locke (2001) provides some anecdotal evidence that at least some organizations have found great success in setting “outrageous” goals, but his discussion of such goals is consistent with a general intuition that such goals are rare in practice.

In this dissertation, I use well-supported ideas from goal setting theory, including goal difficulty, goal mechanisms, and goal commitment, as well as ideas from social cognitive theory (Bandura, 1977, 1982), to develop theory around a new but important moderator of the goal difficulty-performance relationship. I explain how the effect of difficult goals on performance will vary as a function of task experience such that it becomes weaker as task experience increases. Simply put, this is because assigned goals have a diminishing effect on both goal commitment and self-efficacy as workers develop a track record of performance. Prior performance provides more information about the reasonableness of an assigned goal than does the goal itself, and is a more trusted basis for judgments about its attainability, and for decisions about commitment to the goal. The arguments to be explored are important for several reasons. First, once an initial set of goals have been achieved, how do goals work in a repetitive goal setting system? Second, how do goals need to be adjusted for different workers and different situations? Finally, in a typical work situation as in this study, how hard should goals be set in practice for maximum performance?

This study provides a unique opportunity to explore repetitive goal setting in an actual manufacturing environment. To develop these arguments, I first provide a review

of relevant concepts from the goal setting literature, and from social cognitive theory. I then develop a set of predictions regarding the role of task experience in determining the effectiveness of difficult assigned goals. I test my predictions using archival data from a food manufacturing plant that represents 105 individuals in 10 teams over 19 months. I conclude with a discussion of the findings, their implications for theory and practice, and the limitations of the present work.

LITERATURE REVIEW

Goal Setting Theory

Goal setting theory was formulated inductively largely on the basis of empirical research conducted over nearly four decades. It is based on Ryan's (1970) premise that conscious goals affect action. Locke (1977) theorized that rational human action is goal directed and that this goal-directedness can be observed in the behavior of employees at work. A goal is the aim or object of an action, for example, to attain a specific standard of proficiency, usually within specified periods of time (Locke & Latham, 2002). The term goal setting refers to a formal program of setting numerical or quantitative performance levels (goals) for individual or groups. (Pritchard, Roth, Jones, Galgay, & Watson, 1988). A broader research effort in goal setting has also come to include mastery or learning goals (Elliot & Dweck, 1988). However this study will concern itself with the quantitative performance levels. Goal setting can increase performance by: (1) focusing workers' attention and encouraging them to correct mistakes, (2) increasing accountability for work, (3) providing a public indicator of achievement or shortcoming, and (4) adding to motivation through competition (Pritchard, Roth, Jones, Galgay, & Watson, 1988).

To achieve the increased performance mentioned above, four aspects of goal setting theory are particularly relevant to the discussion of setting difficult but attainable goals in organizations – goal difficulty, goal commitment, goal origin (assigned v. self-set), and self-efficacy. Each of these constructs has a substantial body of theoretical and empirical literature supporting its existence and importance. A key contribution of the present work is to integrate these streams of literature to construct a more specific understanding of how assigned goals in the workplace relate to performance, and how this relationship is conditioned by the task experience of a work unit.

Goal Difficulty

Motivation is directly affected by goal setting through four direct mechanisms: amount of effort expended, direction of the effort, persistence to overcome obstacles, and strategy development (Latham, 2004; Locke & Latham, 2002). These mechanisms then function to indirectly cause the cognitive development of strategies to accomplish them.

Amount of effort. Numerous studies have found that the amount of effort expended is directly proportional to the difficulty of the goal. To the extent workers view this effort as necessary and justified to reach the goal, they will exert it. Locke and Latham (1990) reviewed evidence that this is true regardless of the measure of effort. This measurement can be reflected in direct physical exertion, the rate of performance, or the resultant output of a task.

Direction of effort. In directing efforts toward task accomplishment, workers are neglecting irrelevant situations and actions. A specified goal provides information about which task aspects are higher priorities, and thus result in a focus of energies for the maximum benefit of the primary elements of the task. Rothkopf and Billington (1975),

for example, asked participants to read a 6,000 word written passage, and assigned specific learning objectives to some participants. When all participants were tested on their learning from the passage, those with specified goals were found to have learned more of the relevant material.

Persistence. Any undertaking can and often does face unforeseen obstacles.

Persistence in the face of these obstacles is a key component in seeing the task through to higher levels of performance. Similar to the study by Rothkopf and Billington (1975), LaPorte and Nath (1976) asked students to read a prose passage, and were assigned a goal to answer 18 of 20 questions correctly, to answer 5 of 20 correctly, or to do their best. Those participants in the hard goal condition studied longer.

Strategy development. Goals also induce a search for strategies toward better performance (Wood & Locke, 1990). A series of studies (summarized in Locke and Latham, 1990) assigned participants a management simulation task and found that difficult goals led to more exploration of various alternative strategies. Demmert and Klein (2003) assigned a goal to transfer water from one bucket to another, and assigned some an easy goal with an obvious solution, and others a goal difficult enough to make the obvious solution insufficient. Those with the harder goal were more creative in their development of novel strategies. Earley, Connolly, and Ekegren (1989) used a task that asked participants to predict the price of a fictitious stock based on a number of correlates that were related to the hypothetical price according to an undisclosed formula. Those with a more difficult goal for accurate forecasts experimented with more strategies.

Effects of difficulty on performance. Numerous studies have shown that setting specific hard goals leads to a significant increase in employee production (Locke &

Latham, 1984). Locke (1968) emphasized the linear nature of this relationship – as goal difficulty increases, so does performance, as long as commitment to the goal is maintained. Laboratory and field experiments routinely have shown a positive correlation between hard goals and improved performance (Locke, 1966; 1967; 1982; Locke, & Bryan, 1968; Locke, Frederick, Bucker, & Bobko, 1984; Locke & Latham, 1990; Locke, Mento, & Katcher, 1978), for example, loggers cut more trees (Latham & Kinne, 1974; Latham & Yukl, 1975). In one study (Latham & Baldes, 1975), unionized truck drivers increased the logs loaded on to their trucks from 60% to 90% of the legal, allowable weight. The result was a saving of \$250,000 in 9 months to the company. In a subsequent study, \$2.7 million dollars were saved in 18 weeks by assigning the goal of increasing the drivers daily loads to the mill (Latham & Saari, 1982). Word processing operators with specific high goals increased their performance whether the goals were set participatively or assigned (Latham & Yukl, 1975). In a survey of companies from Dun's Business Rankings, Terpstra and Rozell (1994) found a significant correlation between goal setting and organizational profitability.

Measures of goal difficulty. Goal difficulty can be classified as hard or easy, and compared to conditions that have simply no goal, or a goal to “do your best.” Easy goals require little effort or thought. In setting an easy goal, operators may stop once the goal is met even though much more could be accomplished. The result is limited performance. A goal to “do your best” is of little use, as no standard of minimum performance has been set. This allows for a wide range of acceptable performance levels (Locke & Latham, 2002). In a “do your best” event, the results could vary widely as some people will try

harder than others based on their judgment of what is required and the opportunity for self-benefit.

Hard goals, through the mechanisms specified above, lead to higher levels of performance. A specific high goal creates negative discrepancies to be mastered. Effort and resources are mobilized based on the anticipatory estimates of what is necessary for goal attainment (Latham & Pinder, 2005). Latham and Yukl's (1975) review article provides strong support for Locke's (1968) propositions that specific goals increase performance and that difficult goals, if accepted, result in better performance than do easy goals (Wood, Mento, & Locke, 1987).

What defines a harder or more difficult goal? Since the goal concept is primarily a motivational theory, goal difficulty has been defined by many prominent motivational theorists: Lewin's (1944) level of aspiration; Locke (1968); Locke et al. (1981); Locke, Chad, Harrison, and Lustgarten's (1989) statistical approach viewing probability of success; Vroom's (1964) expectancy theory; and Naylor, Pritchard, & Ilgen's (1980) Naylor Pritchard Ilgen (NPI) theory.

Commonality is found with all these theorists in three assumptions: (1) that the construct of goal difficulty must be measurable, (2) goals must be known a priori, and (3) goal difficulty is seen as a discrepancy between ability to perform and the level of the goal. Wright (1992) provides an excellent distillation of the multiple theorists' efforts to derive his own definition of goal difficulty: "The extent to which an individual's goal is discrepant (either positively or negatively) from that individual's capacity to achieve the goal" (p. 283). Based on this review of the literature, I adopt the definition of a hard goal as one that presents a reduced probability of success.

Goal Commitment

Goal commitment is defined as “one’s attachment to or determination to reach a goal, regardless of where the goal came from” (Locke & Latham, 1990, p. 125). Without commitment, outside influences easily distract attention and blur focus. Erez and Zidon (1984) have demonstrated this effect in laboratory experiments. While Locke and Latham (1990) claim that a goal without commitment should have no effect, Erez and Zidon (1984) found evidence that goal rejection can actually harm performance. In their 1984 study, they hypothesized that goal acceptance is negatively related to goal difficulty and that goal acceptance moderates the difficulty – performance relationship in three areas of the spectrum (acceptance > transition > rejection): (1) performance is linearly and positively related to goal difficulty for accepted goals, (2) performance is linearly and negatively related to difficulty for rejected goals, and (3) the slope of this relationship transitions from positive to negative as the goal acceptance transitions from acceptance to rejection. In a two phase experiment, subjects specified their acceptance of a goal on a simple task. All hypotheses, as stated above, were strongly supported by the results.

In an earlier field study, Stedry and Kay (1966) attempted to evaluate goal difficulty - performance relationship for goals set on two competing performance measures. In a manufacturing setting, performance criteria were set by pairing two measures, productivity and rework. Assigned goal levels based on past performance were set with goals defined as normal or difficult. Supervisors’ perceptions of the assignments were categorized as challenging, easy, or impossible. Performance results were measured and supervisor interviews were held. Study results indicated that difficult goals resulted in an extreme of performance, either very good (challenging and easy goals) or very poor

(impossible goals). Also when faced with two goals, effort will be shifted away from the harder goal (rejection, reduced commitment, reduced effort) to the more achievable.

Stated differently, the more achievable the goal, the more accepted it was.

Commitment as a moderator. A key feature of goal commitment is that it serves as a moderating variable between difficult goals and task performance (Klein, Wesson, Hollenbeck, & Alge, 1999). An accepted goal is reflected in the amount of effort that one displays and in the improved outcomes. Less acceptance of a goal allows other competing influences (such as personal or self-set goals) to distract from the main effort. A goal that is totally rejected cannot influence any performance. In organizations, a lack of commitment reveals itself in a “slacking” of effort or “going through the motions”; performance declines. Locke and Latham (1990) cite numerous studies that parallel these same observations. Research has demonstrated that the highest level of effort occurs when the task is moderately difficult and the lowest level when the goal was very easy or very hard (Locke & Latham, 2002).

Antecedents of goal commitment. Locke and Latham (1990) cite a number of factors affecting goal commitment and divide them into a “perceived desirability of trying to attain a goal” and a “perceived ability of attaining the goal” factors. “Perceived desirability of trying to attain the goal” factors include such attributes as authority position, peer group, public statement of attempt, rewards, punishments, valence and instrumentality, and satisfaction. “Perceived ability of attaining the goal” factors include expectancy, self-efficacy, task difficulty, authority (self-efficacy information and trust), competition, attributions, and goal intensity.

The meta-analysis of 74 studies by Klein et al. (1999) found significant support for the relationship between commitment and several of the factors listed by Locke and Latham (1990). They identified the primary antecedents of commitment as: (1) the attractiveness of goal attainment, (2) the expectancy of goal attainment, and (3) motivational force (the multiplicative combination of expectancy and attractiveness). While other attributes (ability, volition, affect, goal specificity, task experience, and feedback) play a role in the relationship, attractiveness, expectancy, and motivational force are the strongest. This further solidifies the findings of Locke and Latham (1990) with respect to the impact of commitment on task performance.

Special Aspects of Assigned Goals

In the organization, goals can either be assigned by superiors over subordinates or can be participatively developed by the superior and subordinate working collaboratively to reach agreement on outcomes that benefit the organization. Research shows that both methods are successful within their organizational framework. Working collaboratively, Locke, Latham, and Erez (1988) found that from a motivational perspective an assigned goal is as effective as one that is participatively set provided that the purpose or rationale for the goal is given (Locke & Latham, 2002). In accepting a task with an assigned goal an employee is looking to answer “what do you want me to do” and his or her acceptance will strongly depend on perceived fairness and difficulty of goals, values of the employee, trust of management, and the perceived legitimacy of management’s demands (Locke, 1977). Assigned goals provide the strongest answer to this question. The goal relates what is to be done and to what level expectations are set regarding performance. The goal originates from the supervisor whose position of power and authority makes

him or her the ultimate judge of performance, the source of aid, and the administrator of reward or punishment. This position of authority, while structured by the organization, can only execute its mission if trust has developed between the supervisor and the workers. In trusting the supervisor, workers believe the supervisor's persuasive direction and encouragement. The importance of the informational aspect of the assigned goal is that it affects commitment. When workers trust that the assigned goal is reasonable, commitment is expected to be higher. The goal-performance relationship is strongest when people are committed to their goals. Acceptance and commitment to a goal are key to that goal's success whether it is by an individual or group (Locke & Latham, 2002).

Self-Efficacy

Self-efficacy refers to "people's judgments of their capabilities to organize and execute a course of action required to attain designated types of performance" (Bandura, 1986, p. 391) Bandura (1989) stated goal setting is first and foremost a discrepancy-creating process (Locke & Latham, 2002). This discrepancy is the difference individuals see in their present situation or level of performance and the expected level of performance. This difference acts as motivation to improve current performance to reduce or minimize the discrepancy. Self-efficacy is concerned with an individual's perception of how they can execute some required course of action needed to deal with a perspective situation (Button, Mathieu & Aiken, 1996; Hollenbeck & Brief, 1987; Locke & Latham, 2002). Education, knowledge, capabilities, experience, and confidence all play an important role in forming one's self-perception.

Bandura (1977) identified four sources of efficacy expectations: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal.

Performance accomplishments are extremely influential in establishing base expectations. Success increases one's mastery expectations while failures might lead to lower expectations. Having performed similar tasks develops a sense that one has done this before and is capable of the new undertaking.

Vicarious experiences refer to the knowledge gained by observing others perform. It allows a sense of "I can do that" to develop. Having watched others perform without much difficulty or having the chance to learn by others' mistakes allows better coping strategies to be developed. Better strategies lead to possibly better outcomes.

Verbal persuasion is the most common method in the attempt to convince people that they are capable of a task. This source is usually weaker than actual experience, which provides a solid comparison reference, and is subject to the esteem, both in knowledge and trust, that one holds of the persuader. Telling someone he or she is capable is part of the supervisor's job in getting his or her subordinates to perform. Persuasion can also come from multiple levels as well as from peers. Verbal persuasion is not as powerful as vicarious experience/modeling, but it is the only immediate method available to Supervisors to affect efficacy; others require time. It is the most powerful external, short-term means that organizations have to influence employees (Bandura, 1977).

Emotional arousal usually arises from environmental stress and taxing situations, which causes people to judge their anxiety and vulnerability to the stress. Self-efficacy becomes a means of measuring anxiety. This also becomes a measure of how one is feeling. A good inner feeling and happy self-awareness will go a long way to seeing the stressful situation as manageable rather than, "I don't feel like bothering with it".

In setting goals, individuals with high self-efficacy will have developed more coping mechanisms to relieve the anxiety brought on by new situations. They will be more confident in their abilities and will set higher goals than those with lower self-efficacy. They are more committed to the stated and accepted goals, use/develop better strategies to achieve the goals and respond more positively to negative feedback (Locke & Latham, 2002). Commitment is likely if the outcome of the goal is important to the person and the person believes that it is attainable (Latham, 2004). In short, goal setting theory is among the most valid and practical theories of employee motivation in organizational psychology (Lee & Earley, 1992; Locke & Latham, 2002; Miner, 1984; Pinder, 1998).

Relationship Between Self-Efficacy and Goal Commitment

Without commitment, there can be no motivational incentive for action (Locke & Latham, 1990, 2002). As discussed above, a vital part of the commitment variable is derived from the expectancy of attaining the goal. This expectancy is the self-awareness or efficacy that one has the knowledge, skills and ability to undertake the task.

Without the perceived ability or the expectation of possible success, commitment is questionable. This self-efficacy (ability) includes the development of task strategies both directly and indirectly related to the task. Personnel, high in self-efficacy, are more likely to possess the knowledge and skills and the perseverance to expend the extra effort that might be necessary. As Locke and Latham (1990) argue, self-efficacy influences commitment, which affects goal attainment/task performance.

HYPOTHESES DEVELOPMENT

In this section, I will develop my argument for the focus of this study, the mitigating aspect of past experience on performance. First, I will look at the relationship between hard goals and performance. Next, I will develop the arguments for associating task experience and performance followed by the connection of the concepts of difficult goals, past experience and performance.

Goal theory has been studied for over forty years as a motivational means to improve performance. During this period, numerous studies, laboratory and field, have shown that the theory is effective (Locke & Latham, 1990). Motivation is spurred through three aspects of endeavor: effort, persistence, and task strategy development (Locke & Latham, 1990). Theorists have long postulated that the harder the goals the better the performance (Locke, 1968). Lord and Hanges (1987) stated that “hard goals produce greater performance because they provide a higher standard around which performance is regulated. They also result in higher effort if higher effort is required to achieve or maintain levels of performance” (p. 164).

Hard goals can also affect a worker’s self-efficacy (Locke & Latham, 1990), which in turn affects performance (Stajkovic & Luthans, 1998). As defined by Bandura (1977), self-efficacy is the view that individuals (or groups) have of their capabilities. When a supervisor, for instance, assigns a goal to a worker, the mere setting of the goal carries information about the level of performance that is expected, normal, and attainable (Erez & Zidon, 1984; Locke & Latham, 1990). Persons low in self-efficacy will lack this commitment and will shy away from the challenge, believing that they lack

the knowledge or experience. If a goal is viewed as too difficult, commitment will be reduced (Erez & Zidon, 1984) and the goal may be rejected (Stedry & Kay, 1966), resulting in a lack of effectiveness of the goal.

Overall, these arguments lead to a prediction that more difficult assigned goals will lead to higher levels of performance. Though this prediction has been made and tested previously, I propose it here as a formal hypothesis for the sake of consistency.

Hypothesis 1: Goal difficulty is positively associated with task performance.

Hunter (1980) reported a positive relationship between workers' experience on the present job and their supervisor's rating of their performance, based on a meta-analysis of 425 correlations from prior literature (see Hunter & Hunter, 1984). Schmidt, Hunter, and Outerbridge (1986) reasoned that this effect was due to learning – through task experience, workers gain specific knowledge about the task. In addition to job experience contributing to gaining of knowledge, a byproduct was seen in the “acquisition of skills, techniques, methods, psychomotor habits ... that directly produce improvements in performance capabilities independent of increases in job knowledge” (p. 436).

Proven Strategies

When experienced workers are assigned a goal, other factors come into play. In strategy development, Locke and Latham (1990) propose that two sets of skills/knowledge come into play: Stored Universal Plans (SUPs) and Stored Task Specific Plans (STSPs). SUPs are skills and knowledge that one acquires throughout life,

either by dedicated study or by observance of others. One recognizes a similarity of knowledge and judges its appropriateness in application to the task. STSPs are more specific and deal generally with the knowledge gained in past repetitions of the same or similar tasks. Instances of past success or failure will inform these plans, which will be applied to work tasks.

Measurement of Task Experience

Through numerous studies the definition of work experience has taken on many forms, most often related to time, opportunities and repetitions. Ford, Seago, Quinones, and Speer (1991) found that the most often used parameter is time, or tenure. Repetition of task and number of times of performance have been used in other studies (cf. Lance, Hedge, & Alley, 1989; Vance, Coovert, MacCallum, & Hedge, 1989). In their meta-analysis, Quinones, Ford, and Teachout (1995) established two dimensions of experience that encompassed the literature: “measurement mode and level of specificity”.

Measurement mode included amount, time and type. Level of specificity includes task, job, and organization. From these components they constructed a 3 x 3 matrix showing each of the types of combinations that can apply to define work experience. How long has an individual been in an organization, position, or how long has he or she been working at a particular task. How many times has the individual performed a task or operation in the past? Research shows that each of the definitions proves useful (Quinones et al., 1995).

Defining performance has similarly shown to have different measuring units. Quinones et al. (1995) divide these measuring units into two categories that they term “soft and hard”. Soft measures of performance consist of personnel performance

evaluations either by supervisors or self. These tend to be subject to ambiguity and rater bias and were viewed as attenuating actual performance. Hard measures are usually quantitative in nature and give a better sense of performance, especially when compared to a goal or standard.

In a meta-analysis of 44 past work experience-job performance studies, Quinones et al. (1995) found positive correlations between work experience, defined by both the “measurement mode” and “level of specificity”, and job performance. The strongest correlations existed between work experience and job performance when experience was measured at the task level and performance was rated on hard measures. In sum, prior theory and evidence point to a positive effect of experience on performance. While this relationship has previously been predicted, tested, and supported, I hypothesize it formally for the sake of consistency:

Hypothesis 2: Task experience is positively associated with task performance.

While the simple effects of both goal difficulty and task experience on performance have been well documented, there are at least three primary reasons to expect that they will interact, that is, the effect of goal difficulty may depend on task experience. First, some information that is conveyed by the goal assignment process is less valuable or credible to workers with more task experience. Second, when goal setting is repeated over many trials, the mechanisms through which difficult goals affect performance – namely, effort and strategy development – may be characterized by ceiling effects. For instance, the impact of goal setting may drive effort in early rounds of goal

setting, but over time, it becomes more difficult to achieve higher performance simply by exerting more effort. Similarly, over time, workers exhaust their ability to conceptualize and experiment with innovative strategies that might produce performance improvements. Lastly, as higher performance levels are not obtained, a reduced self-efficacy can form and impact commitment.

Information Contained in Assigned Goals

Assigned goals are usually derived from organizational needs. They tie the employees' actions to the efforts necessary to achieve organizational goals. Assigned goals contain information about performance. They denote a level of performance that is appropriate, expected, and attainable. Originating from authority figures be it the President/CEO or the immediate supervisor, the goal statement will align employees to the necessary processes and provide them the direction. Acceptance and effectiveness will be influenced by their respect for the supervisor and their own self-efficacy.

Trust in the Supervisor. When faced with a novel task, individuals will look for signals from supervisors regarding appropriate and attainable goals. Supervisors may be viewed as experts on the task, and the goals that supervisors set carry the weight of an officially sanctioned level of performance. Employees, in good faith, strive to meet established goals because that is all they know and what they perceive is the expectation. It also becomes a sign that the supervisor has confidence in them and that he or she will support their efforts.

By definition, hard goals are more likely to result in failure than moderate or easy goals. When a supervisor enacts a policy of setting difficult goals, frequent failure will result. However, failure to reach a goal has an effect on the trust that an employee has for

a supervisor and the assigned goal. When goal failure starts to become the predominate theme, I reason that workers will recognize a pattern of goals that are not attainable and trust will erode. When workers learn to doubt the attainability of the goal, the informational power of goal assignment will wane as well. Failure to recognize the demoralizing affects that continued goal failure will have on employees can only result in the chance that commitment to the goal will be low (or rejected), and that the effect of goal difficulty on performance will be diminished as a result (Klein et al., 1999).

Ceiling Effects in Repeated Goal Setting

Schmidt, Hunter, Outerbridge, and Goff (1988) cite earlier work (Blankenship & Taylor, 1938; Fleishman, 1965; Ghiselli & Brown, 1947; Taylor & Smith, 1956) suggesting that the relationship between job experience and job performance is non-linear; with increases in job experience, the rate of increase in job performance declines. With all undertakings, a learning curve develops. New tasks require new skills and methods of performance. Initially performance is low and lacking in consistent specification standards. As time progresses, participants gain in knowledge and action and the performance outcome improves. Over time, performance improvement continues, but slows or plateaus as workers reach a point where additional job knowledge is lacking or harder to come by.

In a manufacturing setting, this state of affairs is referred to as an optimized system. The method of performance has been established, the number of workers has been set, and machines are running at the best possible settings. Incremental increase in performance may be possible, but only by making personnel work harder, longer, or faster. This cannot be maintained indefinitely without process degradation.

In motivational terms, a similar optimization process may be attained. When a task is novel, the motivational properties of a difficult goal may drive increased effort, or improved strategy development. It could speed the process of searching for job knowledge or searching for improved strategies for performance. A difficult goal may move workers up the learning curve faster. At some point, though, workers reach a point where increased effort is either not possible, or has been judged not to be worth whatever inducements are offered. Alternative strategies have been identified and tested, and the most effective ones have been adopted. At this stage, assignment of a harder goal only leads to failure to meet the goal and discouragement.

Efficacy Effects

People taking on a task will judge that task against past experience. First time performers with no knowledge of the requirements or expectations will look for clues from other personnel (e.g., assigned goals). For inexperienced employees, information contained in the goal can be considered verbal persuasion, an antecedent to self-efficacy (Bandura, 1977). In the laboratory, study participants accept the efficacy-related information in the goal, because the experimenter may be presumed to have a good understanding of the task and the level of performance that might be attained (Locke & Latham, 1990). They will be more accepting of whatever guidance is provided since they have nothing to judge it against.

Persons who have past experience, on the other hand, know how much effort has been expended in the past, how long they will have to persist to reach a level of performance, and what types of strategies work or could be tried. None of this is available to first time performers; the more experienced operators will produce the better

outcome. Bandura (1977) relied on a series of studies of self-efficacy to conclude that information based on past experience is a more powerful predictor of self-efficacy than verbal persuasion. Thus, more experienced workers will be less likely to be convinced that a difficult goal (one that exceeds their prior performance) will be attainable. I posit that this will result in lower self-efficacy, reduced commitment to the goal, and eventually in a limited impact of goal difficulty on performance.

Together these arguments lead to the novel prediction of the present study, specifically that task experience acts as a moderator of the goal difficulty-performance relationship. Formally, I predict:

Hypothesis 3: Goal difficulty and task experience will interact such that the positive effect of goal difficulty will weaken, become less positive, possibly becoming negative, as experiences increases.

METHOD

Data and Setting

Archival production data was obtained from a small, Midwest bakery, manufacturing firm. The firm employs approximately 120 employees in making multiple product lines of baked dessert products: cookies, cakes, muffins, pies, and specialty items; production processes vary in their complexity. This study selected the three highest volume products (cookies, cakes, and muffins) for examination as these will represent the majority of the production effort. Production data covers the period January

2010 to August 2011. The firm employs lean manufacturing methods to optimize processes, reduce waste and increase efficiency. Goal setting principles are utilized to motivate employees and improve performance.

On any given production day, two of the three high volume products will be produced along with other minor products as dictated by customer requirements. The factory machinery and setups are highly flexible as should be expected by lean principles (cellular manufacturing). The same employees and machines may be used in different arrangements for a variety of products. There is very little dedicated equipment or floor space assigned to only one product line. One day employees may be producing cookies and cakes, and the next day muffins. The plant operates around the clock, three shifts, six days a week. The same variety of products can exist on all shifts, although each shift usually becomes the primary shift for that product, i.e., 1st shift cookies, 2nd shift cakes, and 3rd shift muffins. Goals are set for each product run. When a run is scheduled, the number of units to be produced and the time allotted for the run are posted in plain view of the workers. Daily production performance by product line and shift is tracked and posted publicly for employee review. The company has set a company-wide labor efficiency goal of 80% of what is theoretically able of being produced in a given time period which applies to all shifts and product lines. The assigned goal reflects a formula that accounts for units produced, personnel utilized, and time of production as measured against an established standard. The posted goal for units of production and time allotted is calculated for each production run according to this formula. For example, if a crew of five personnel could potentially produce 10,000 units in an 8-hour shift under the most

favorable circumstances, a minimally acceptable level of production would be 8,000 units (80%).

Production methods are classified as manual and semi-automatic in their complexity. These production methods are important to this study because they place people directly in the production process. Without them and their energies (motivation/effort/persistence/strategies) production would not occur. If production were more automated, output would be more attributable to pushing a start button and maximizing equipment run time.

The majority of the process lines consist of 11-14 employees assigned to forming, assembly, packaging, and logistical operations for the shift. The packaging process uses a set staffing standard of 4-7 member teams, depending on the complexity of the final step to accomplish the work (e.g., Pick up and place ten cookies into a package, close, label and place a specific number of packages in a cardboard case, stack the cases on a pallet for storage and shipping). Allowances are made for absences with the temporary addition of company employees or outside temporary workers. Within the group, team members rotate job duties to relieve ergonomic stress and boredom.

While all employees are cross-trained on the multiple products and processes, teams are fairly constant in their member makeup and assigned to the same lines. For this reason, the primary unit of analysis in this study is specific production shifts – a largely stable group of workers who are assigned to a set of production runs over the course of each workday.

Measures - Dependent Variable

Task performance. The dependent variable, *task performance*, will be measured by the units produced per hour (cookies, cakes, or muffins) by a production team for a given production run within a scheduled shift of eight or ten hours. Normally most products will be run for the entire shift. Exceptions can occur due to order schedule changes, equipment failures, or when supply parts outages dictate a shorter run. Values of this variable will be limited by the nature and functionality of mechanical and automated processes, but are also sensitive to employee motivation levels.

Measures - Independent Variables

Task experience. The host facility produces several products (cookies, cakes, and muffins), and discussion with management indicates that the tasks, skills, and strategies necessary for producing each one vary considerably. Thus, the number of production runs of a particular product that a team has completed in the past three weeks will serve as a measure of *task experience*. For example, a production team may have run cookies 15 times, cakes 8 times and not run any muffins while another team would have run cakes 15 times, cookies 5 times and muffins 4 times. Three weeks was chosen as the evaluation period for several reasons: (1) sufficient period of time for employees to develop a recent memory of performance, (2) sufficient time to produce some variance in the task experience, (3) historically the three weeks is a typical production/inventory build period for most any product entering a high holiday demand (i.e., cakes for Easter) or special sales promotion; and (4) by expert knowledge based on significant observation of this work force by the host organization's production manager over a period of more than ten years.

Goal difficulty. All production teams are assigned a goal for productivity that is determined completely by the established standards for the product line (i.e., cookies 35 units/min; cakes 20 units/min; muffins: 15 units/min). That is, a particular unit's goal level does not take into account its experience, or its prior level of productivity in producing a particular product. However, as Wright (1992, 1995) has noted at length, such a goal will not be equally difficult for all workers. For production units with sufficient knowledge, skills, abilities, experience, and teamwork, they may find the goal relatively easy, and routinely surpass the level of performance defined by the goal. Other units may find their skills to be less compatible with the task, and struggle to reach or attain the goal. The products included within this study are relatively simple in their form and finish (bake and pack). Other products (e.g., pies, iced cakes, cupcakes, specialty pies, etc) that require slicing to provide portion control or decorating/iced topping involve more complex equipment, slower process rates and more manual dexterity in their completion. Operators undertaking these processes will be more challenged in their ability to meet the desired goal.

Thus, *goal difficulty* in this study will be operationalized based on the distribution of a production unit's prior performance in producing a specific product over the past three weeks. Specifically, the mean and standard deviation of a unit's prior performance in producing the product will be calculated. Then difficulty will be measured as the z-score of the performance goal relative to that distribution (Locke, 1968). Formally,

$$\text{goal difficulty} = \frac{(\text{goal level} - \text{mean prior performance})}{\text{standard deviation of prior performance}}$$

Control Variables

Prior performance. Consistent with the discussion of goal difficulty, prior performance, for any combination of group and product line, consists of the average number of units produced per hour for that specific combination over the prior three week period of observation.

Number of employees. Though absences are often dealt with by moving workers within the plant, or supplementing with temporary employees, not every production line is fully staffed each day. Since productivity may be greatly affected by a labor shortage, I use the deviation from standard number of workers assigned to the production run as a control variable. Zero would indicate staffed to standard, plus one (+1) would be an over staffing of one worker and minus one (-1) an understaffing of one worker.

Time. Over time, the addition of new equipment, maintenance of existing equipment, implementation of process improvements, or other management action may affect productivity. To help account for these effects, I include time (measured as number of days since the start of the observation period, i.e., 1 to 577, representing Jan. 1, 2010 to Aug. 1, 2011) as a control variable.

ANALYSIS AND RESULTS

Step-wise regression analysis was employed to test the hypotheses. In the first step of the analysis, only the control variables are included as predictors. In the second step, task experience and goal difficulty was added to the model. In the third step, the interaction between goal difficulty and task experience was included as a predictor. For

each hypothesized relationship, hypotheses are considered to be supported if the step that adds the predictor in question increased the variance explained by the model (based on an *F*-test), and if the coefficient for the specific relationship in question is statistically significant. A one-tailed alpha level of 0.05 was used to assess the statistical significance of all tests.

Data Cleanup

The primary unit of analysis was the production shift. The result was 788 observations, each representing a unique combination of shift, product, and date. The data were examined for deviations from normality, as well as for outliers. The distribution of the dependent variable (current performance) was highly kurtotic (kurtosis = 13.18). However, with larger sample sizes, deviations in kurtosis have a smaller effect on the overall model, and can usually be safely ignored (Keppel & Wickens, 2004).

The determination of goal difficulty required the calculation of the standard deviation of the prior performance over the previous three week period. This aspect of the data was examined carefully, since estimates of standard deviations based on samples as small as 5 observations might be unstable. The distribution of standard deviation estimates revealed several data points that could affect the analysis. Using Tukey's (1977) definition for outliers (defined as values that lay more than three times the interquartile range beyond the first or third quartile), fourteen values were removed. This left 774 observations in the final data analysis. Comparison of model performance before and after cleanup was not affected.

Tests of Hypotheses

Means, standard deviations, and correlations are presented in Table 1. The table shows many of the variables to be highly correlated. Providing initial support for Hypothesis 1, goal difficulty was significantly and positively correlated to task performance ($r = .09$). In contrast, and not supportive of Hypothesis 2, task experience was opposite in sign ($r = -.35$) and did not correlate to task performance as predicted.

Table 2 presents models used to test hypotheses. Three models were used to test the hypotheses. The first model included only control variables, including time, number of employees, and prior performance. Overall, the model explained 66% of the variance in current performance. The most strongly predictive variable in Model 1 was prior performance ($B = 0.98$; $SE = 0.03$; $p < .001$). The effects of time ($B = 0.00$; $SE = 0.02$; $p = 0.93$) and number of employees ($B = -0.99$; $SE = 2.13$; $p = 0.64$) were not statistically significant predictors of current performance.

Table 1
Correlations and Descriptive Statistics

	Mean	SD	1	2	3	4	5	6
1. Task Performance	317.01	71.10	-					
2. No. of Employees	-0.84	0.88	.34	-				
3. Time	184.01	110.80	.32	-.23	-			
4. Prior Performance	312.09	59.52	.81	.43	.39	-		
5. Task Experience	0.71	9.53	-.35	-.02	-.05	-.38	-	
6. Goal Difficulty	0.01	1.59	.09	.49	-.43	-.01	-.10	-

Note: N = 774. Correlations greater than +/- .08 are statistically significant at $p < .05$

The second model included all of the variables included in Model 1, but added task experience and goal difficulty as predictors. Overall, the model remained statistically significant ($F_{(5, 768)} = 322.46; p < .001$). Compared to Model 1, Model 2 explained an additional 2%, or a total of 68%, of the variance in current performance. The difference in variance explained by Model 2 was statistically significantly greater than that explained by Model 1 ($F_{(\Delta R^2)} = 18.90; p < .001$).

Table 2
Results of Analysis Models Predicting Performance

	<u>MODEL 1</u>		<u>MODEL 2</u>		<u>MODEL 3</u>	
	B	SE	B	SE	B	SE
No. of Employees	-0.99	2.13	-6.32	2.42 **	-5.56	2.42 *
Time	0.00	0.02	0.03	0.02	0.07	0.02***
Prior Performance	0.98	0.03***	0.98	0.04***	0.97	0.04***
Task Experience			-0.14	0.18	-0.12	0.17
Goal Difficulty			6.77	1.16***	13.35	2.26***
Task Exp. X Goal Diff.					0.53	0.16***
R ²	0.66		0.68		0.68	
Δ R ²	-		0.02		0.02	
F (Δ R ²)	-		18.90 ***		16.59 ***	

Note: N=774; *p<.05 **p<.01 ***p<.001

In Model 2, the effect of prior performance remained statistically significant ($B = 0.98$; $SE = .04$; $p < .001$). The effect of time and task experience did not reach a level of statistical significance. The first hypothesis predicted that more difficult goals would be associated with higher levels of performance. The effect of goal difficulty was positive and statistically significant ($B = 6.77$; $SE = 1.16$; $p < .001$); as such, Hypothesis 1 was supported. Hypothesis 2 suggested that task experience would be positively associated with task performance. The effect of task experience was not statistically significant ($B = -0.14$; $SE = 0.18$; $p = 0.42$), and, contrary to the hypothesis, was negative in sign. Thus, Hypothesis 2 was not supported.

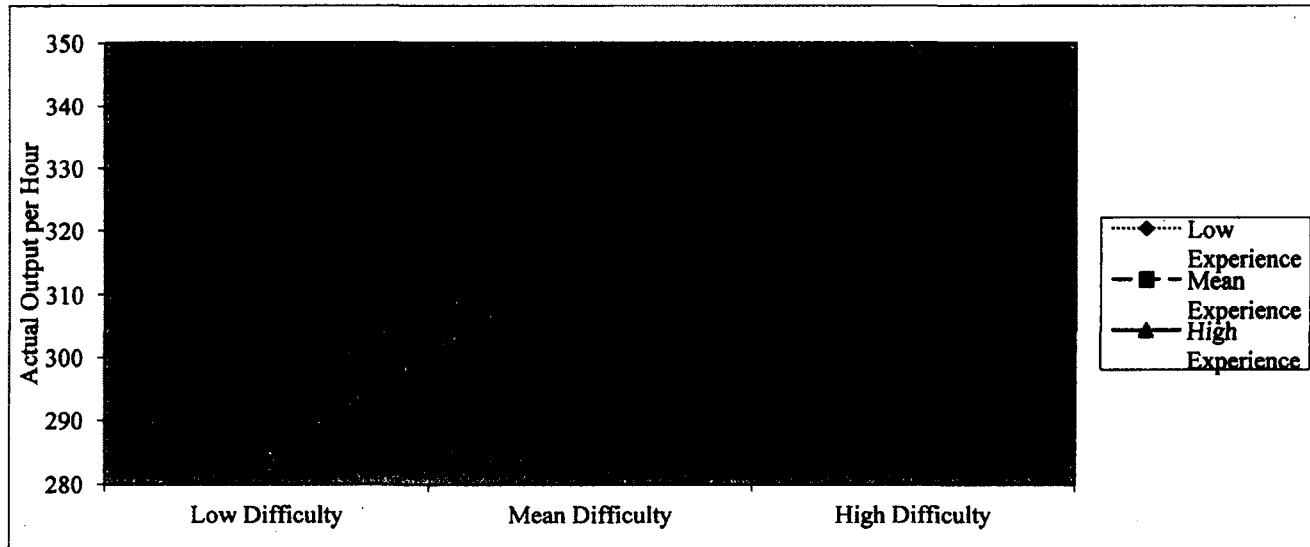
Model 3 included all variables in Model 2, as well as a multiplicative term representing the interaction of task experience and goal difficulty. Overall, the model remained statistically significantly predictive of current performance ($F_{(6, 767)} = 274.68$; $p < .001$). Model 3 explained 68.2% of the total variance in current performance, or an additional 0.2% compared to Model 1. The explanatory power of Model 3 was statistically significantly greater ($F_{(\Delta R^2)} = 16.59$; $p < .001$) than Model 1. In Model 3, the effect of time on performance ($B = 0.07$; $SE = 0.02$; $p < .001$) became statistically significant, and was larger in magnitude than in the models that did not account for the interaction of difficulty and experience.

Hypothesis 3 predicted that goal difficulty and task experience would interact such that the positive effect of goal difficulty will weaken, become less positive, possibly becoming negative, as experience increases. The interactive effect of experience and goal difficulty ($B = 0.53$; $SE = 0.16$; $p < 0.001$) was statistically significant. However, the

effect was not in the hypothesized direction; more extensive task experience was associated with a *stronger* effect of goal difficulty. The interaction is depicted graphically in Figure 1. As such, Hypothesis 3 was not supported.

Figure 1: Predicted Output per Hour as a Function of Prior Task

Experience and Difficulty of Assigned Goal



DISCUSSION

This study built and tested theory about the effects of hard goals, experience, and their interaction on current performance (Locke & Latham, 1990). This is an important aspect to study because it is an extension of the basic principles of goal setting and task experience. I posited that hard goals improve performance, and past experience will improve performance, but that experience will also dampen the positive effects of goals.

The context in which I study goal principles is not unique – many organizations set goals on a periodic basis – daily, monthly, or annually. But the goal setting literature has little to say about what kind of goals are effective in this context. Laboratory studies especially (e.g., those reviewed in Locke, 1968) are prone to this shortcoming, but even field studies (e.g., those reviewed in Latham & Yukl, 1975) fail to address the problem of repetitive goal setting.

The first hypothesis, predicting a positive effect of goal difficulty on performance, replicated the usual results found in past works (Locke, 1968; Locke & Latham, 1990). Failing to find support for Hypothesis 2, task experience will positively affect performance, was a surprise considering past research. Hypothesis 3, the heart of this study, predicted the interaction of goal difficulty and task experience. This hypothesis was not supported, since the interaction was found to be statistically significant, but in the opposite direction from the hypothesized relationship.

Limitations and Future Research

Methodological issues and lack of findings. The failure of both task experience and the hypothesized interaction between goal difficulty and task experience to predict performance in this study might be explained by a number of issues of context, design, and analysis. The first indication that something unusual existed about the data set was evidenced by the lack of support for Hypothesis 2, which predicted an effect of past experience on performance. This premise has been tested successfully many times before. In the present case, this could be due to learning from experience that occurred outside of the 21-day “recent experience” window, or because the work tasks were not as substantially different from each other as assumed. Failure to find support for the interaction hypothesis could be the result of this limitation.

Another explanation is that these failures may be due to a violation of the assumptions of ordinary least squares regression analysis - independence of observations. In analyzing each shift’s performance, the analysis assumed each day’s performance to be separate and independent. Put differently, the analysis assumed that what was produced today had nothing to do with what was made yesterday or tomorrow, except as it related to differences in prior performance and goal difficulty. However, the same personnel are processing the same (or similar) products, using the same procedural processes and equipment; the shifts and shift-product combinations repeat day after day. Any consistent characteristics of the context – supervision levels, supervisor focus on goals or response to goal failure, employee tenure, and so forth – could account for serial dependence in the data. This issue is especially important because the prior performance was calculated as a 21-day moving average; the difference in performance for a shift-

product combination from one day had substantial overlap with the calculation of prior performance in the observations around it.

A third, and perhaps most likely, explanation is that the variation in performance over time may be partly due to regression to the mean (Cook & Campbell, 1979). This stems from a measure of goal difficulty that is dependent on past performance. Under this scheme, groups that did poorly in the past may have done so due to random chance or some other non-recurring event. This would result in both (a) a measure of difficulty that represents a very hard goal, and (b) performance improvement. Thus, a non-causal positive correlation between goal difficulty and current performance would be observed, consistent with the results of this study. If some of these non-recurring barriers to productivity were more likely for low-experience groups and less so for high-experience groups, this could also have affected the interaction.

Fourth, in this study, it was necessary to make decisions about the amount of past experience that was relevant. I used a 21 day window, and excluded groups that had produced a particular product fewer than five times. This could cause one statistical issue, and one conceptual issue. Statistically, the relatively small numbers of observations that were used in calculating the standard deviation of past performance may result in unstable estimates of the standard deviations. This could impact the analysis in substantial, yet unpredictable ways. Methodologically, it could be that even fewer than five recent experiences with a specific task would be enough to move up the learning curve and perform similarly to those with more experience. On the other hand, it may be that knowledge and skills acquired from experience that was more than 21 days old was

still quite relevant, and that three weeks was not enough for skills to decay to a point that was substantial.

Finally, the goals under examination were in use before the time of observation. So, to the extent that the goals were motivational, they may have impacted both past performance and current performance. Given that the correlation between past performance and current performance was very high, this is almost certainly true to some extent. Since past performance is controlled for in the analysis, some of the effectiveness of goals would be captured in the past performance measure, and thus, the interpretation of the effect of goals on current performance becomes complicated. The measured coefficients would represent the effect of current goals on performance only above and beyond the motivational effects of prior goals.

Implications of the unexpected interaction. The failure to find support for Hypothesis 3, the interaction of task experience and goal difficulty, presents an interesting dilemma and opportunity for future research. The hypothesis suggested that these two variables would moderate or weaken the previously tested concept of the positive effects of hard goals. The results presented here suggest that they do have an interactive effect on performance, but one that is positive. If this result were to be replicated in future studies, it might suggest that workers with more experience are prone to a lack of motivation (because of familiarity, security in their position, boredom, etc.) that might be overcome by goal setting. Alternatively, it could be the case that all workers search for strategies to improve performance, but experienced workers are simply more successful in this process. These two mechanisms are conceptually very different and may provide a direction for future research.

Additional limitations of the research setting. Researchers constantly strive to understand their theoretical studies in light of real world application. This field study provided a unique opportunity to explore goal setting in a manufacturing environment where goals are routines set every day, but vary in difficulty because different workers have different abilities and different experience with a given product. Compared to laboratory settings, field work of this type introduces complexities and challenges that make drawing conclusions more difficult.

Several circumstances existed which complicated the study. Non-independence of the observations, regression to the mean (Cook & Campbell, 1979), accounting for variation in performance, the small number of observations that formed the basis for determining past performance and its standard deviation, and the fact that goals had already been in existence when this study was formulated and their impact on current performance all combined to present challenges to this study's conclusions. However, this does depict goal setting in the field.

Additional aspects of the research context limited the study. While this organization has been improving measuring processes with more automated processors and counting equipment, it still experiences difficulties in reliability and data transfer. This can result in missed as well as double counting of items, thus affecting any specific production output. Data recording interruptions during the shift might be reflected in two separate performances (data runs) versus the single production process. This could produce two poor performances when in fact a single good run occurred. Enhanced data recording, which may not be possible within the firm's capital expenditures, or more careful daily tracking of the production data, could address these issues.

Secondly, the organization has adopted a continual improvement philosophy through lean manufacturing methods. This continuous improvement has been directed at eliminating waste in various forms and setting up the most efficient manufacturing processes. Addition of new equipment, addition of new products as well as the elimination of some products that did not perform well in the marketplace or created excessive cost challenges in the production process all contributed to streamlining the company. None of these changes could be sufficiently targeted to specific dates such that an inflection could be noticed in the production output. While time was used as a control variable over the entire period to account for these occurrences, a more accurate study could be conducted if specific break points/changes could be identified. Though the researcher and management agreed that variations in performance were likely affected by experience and motivation, process improvements may have had the effect of removing the human element from the production process to the extent that motivation was less important than originally judged.

A third limitation stems from the fact that goal setting had been in existence for several years prior to this study. While this setting offers an opportunity to evaluate repetitive goals, one affecting physical efficiency the other motivational encouragement, have achieved a certain level of performance that results in very little variation. Though this would be good for the manufacturer, it could have created a ceiling effect such that prior goals had maximized motivation, or routinized it to the point where daily goals had little effect.

Considerations for future research. Measuring goal difficulty involves a lot of judgment calls and must be done very carefully. In the present study, the distinction

between goal level and goal difficulty (Wright, 1992) was made, and goal difficulty was measured as a function of past performance. Thus, though goal difficulty varied considerably from group to group, goal *level* was quite stable for a given product. That is, a goal of producing 300 cakes per hour may be difficult for a work group that had little experience with the task, and was comprised of new, less capable, or unmotivated employees, but the same goal might be quite easy for a long-established team that produced cakes on a daily basis and had demonstrated their ability with consistently high performance.

Perhaps the most valuable contribution of the current study is that it reveals the complexity of the operationalizations of goal difficulty, and suggests that additional theoretical and empirical attention to the issue may be warranted. This is especially true for contexts, like this one, in which goals are assigned based on aggregate means, and not customized to individuals or work units. Under these conditions, the operationalization of goal difficulty is exceptionally complex, and key to any empirical examination of goals.

The field study is absolutely essential to understanding the practical application of goals setting principles. Researchers should actively seek out businesses and organizations that have embraced goal setting as a process improvement tool. In today's business world this is not rare. Studying goal mechanisms from their initiation within an organization will allow a clearer break between old policies and the new more motivational ones.

As seen in this study, production data alone is not enough to fully evaluate complex variables such as goal difficulty. This requires the direct input of the individual workers and a targeting of the specific processes. Broad topics or multiple process

inclusions could blur the true valuation metric. This goal is hard, this one is easy; viewed together the true sense of difficulty may be somewhere in between and still vary among the breadth of experience in the group.

Just as there is no single proscribed method for setting goals, all methods deserve to experience the same scrutiny to evaluate their effectiveness. This is especially needed in the repetitive goal setting scenario. Organizations will continue to rely on the excellent outcomes that have been experienced with application of this theory. They deserve to have the best guidance available from the theorists.

Final Conclusions

While not all of the hypotheses were supported, the study did achieve its “goal”; several worthwhile factors were learned and lay the ground work for others to follow. First, data collected in real world settings provides numerous challenges to the researcher. This study only looked at performance from a historical aspect without the benefit of knowing other associated factors that influence performance, i.e., efficacy, rewards, or job satisfaction. Are the organization’s goal setting processes set up correctly? Are they measuring and tracking the correct data? Is it being applied in a consistent and motivational fashion? I believe so in this case, but research also shows that there are other methods and procedures that might achieve more success, such as more widely integrated processes and a reward system to accompany the success. There is no one right system for all.

This was a study of opportunity; the timing, the circumstance and the participants were available. Not all organizations have adopted goal setting to improve performance. It might be difficult to find several that would make good testing platforms. The

application of goal theory itself has many different forms. Who is to say that any one organization is better at it than another? If they are, would their goal systems result in data that more closely aligns with laboratory research?

Repetitive goals present numerous problems. To achieve a level of performance over a long period of time, months or a year, is easy to visualize. We see it all the time: Our sales goal for this year is 10% higher than last; we'll build twenty houses in the next two months. But to experience the same goal each day (i.e., produce 1000 units per day everyday) could generate a different sense of the performance and its achievability, not to mention the effect on learning and efficacy. How would you characterize yesterday's learning into today's performance if you always meet the goal? What if you always fall short? The means for measuring goal difficulty in such a case must come from separate sources, i.e., employee surveys; the data itself will not be sufficient.

Real world goal setting study is hard work. It takes preparation and diligence to find the correct situation and to visualize what is capable of being done within the limitations that will surely exist. But it will be an exciting and worthwhile effort for in conducting the study, one will also get to engage with some exciting organizations. It is my hope that this study will spur others to ask a question that may be the most basic question of goal setting in organizations, yet remains poorly understood in a very common context: In a system of repetitive goal setting, how hard should goals be to maximize performance?

REFERENCES

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychology Review*, 84 (2), 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
- Bandura, A. (1986). *Social foundations of thought and action: A social-cognitive view*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1989). Human agency and social cognitive theory. *American Psychologist*, 55, 1175-1184.
- Blankenship, A. B. & Taylor, H. R. (1938). Prediction of vocational proficiency in three machine operations. *Journal of Applied Psychology*, 22, 518-526.
- Button, S. B., Mathieu, J. E., & Aiken, K. J. (1996). An examination of the relative impact of assigned goals and self-efficacy on personal goals and performance over time. *Journal of Applied Social Psychology*, 26, 1084-1103.
- Carroll, S. J., & Tosi, H. L. (1973). *Management by objectives*. New York: MacMillan.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Chicago: Rand McNally.
- Demmert, H., & Klein, D. B. (2003). Experiment on entrepreneurial discovery: An attempt to demonstrate the conjecture of Hayek and Kirzner. *Journal of Economic Behavior & Organization*, 50, 295-310.
- Earley, P. C., Connolly, T., & Ekegren, G. (1989). Goals, strategy development and task performance: Some limits on the efficacy of goal setting. *Journal of Applied Psychology*, 74, 24-33.
- Erez, M. & Zidon, I. (1984). Effect of goal acceptance on the relationship of goal difficulty to performance, *Journal of Applied Psychology*, 69(1), 69-78.
- Ford, J. K., Segó, D. J., Quinones, M. A., & Speer, J. (1991, April). The construct of experience: A review of the literature and needed research directions. Paper presented at the Sixth Annual Conference of the Society for Industrial and Organizational Psychology, St. Louis, MO.
- Fleishman, E.A. (1965). Attitude versus skill factors in work group productivity. *Personnel Psychology*, 18, 253-266.

- Ghiselli, E. E. & Brown, C. W. (1947). Learning in accident reduction. *Journal of Applied Psychology, 31*, 580-582.
- Hollenbeck, J. R. & Brief, A. P. (1987). The effects of individual differences and goal origin on goal setting and performance. *Organizational Behavior and Human Decision Processes, 40*, 392-414.
- Hunter, J. E. (1980). Validity generalization for 12,000 jobs: An application of synthetic validity and validity generalization to the General Aptitude Test Battery (GATB). Washington, D.C.: U.S. Employment Service, Department of Labor.
- Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin, 96*, 72-98.
- Ilies, R., & Judge, T. A. (2005). Goal regulation across time: The effects of feedback and affect. *Journal of Applied Psychology, 90*(3), 453-467.
- Klein, H. J., Wesson, M. J., Hollenbeck, J. R., & Alge, B. J. (1999). Goal commitment and the goal-setting process: Conceptual clarification and empirical synthesis. *Journal of Applied Psychology, 84*(6), 885-896.
- Knight, D., Durham, C. C., & Locke, E. A. (2001). The relationship of team goals, incentives, and efficacy to strategic risk, tactical implementation, and performance. *Academy of Management Journal, 44*, 623-639.
- Lance, C. E., Hedge, J. W., & Alley, W. E. (1989). Joint relationships of task proficiency with aptitude, experience, and task difficulty: A cross-level interactional study. *Human Performance, 2*, 249-272.
- Laporte, R. E., & Nath, R. (1976). Role of performance goals in prose learning. *Journal of Educational Psychology, 68*, 260-264.
- Latham, G. P. (2004). The motivational benefits of goal setting. *Academy of Management Executive, 18*(4), 126-129.
- Latham, G. P., & Baldes, J. J. (1975). The "practical significance" of Locke's theory of goal setting. *Journal of Applied Psychology, 60*(1), 122-124.
- Latham, G. P., & Kinne, S. B. (1974). Improving job performance through training in goal setting. *Journal of Applied Psychology, 59*, 187-191.
- Latham, G. P., & Locke, E. A. (1991). Self regulation through goal setting. *Organizational Behavior and Human Decision Process, 50*, 212-21-47.

- Latham, G. P. & Pindar, C.C. (2005). Work motivation theory and research at the dawn of the twenty-first century. *Annual Review of Psychology*, 56, 485-516.
- Latham, G. P., & Saari, L. M. (1982). The importance of union acceptance for productivity improvement through goal setting. *Personnel Psychology*, 35, 781-787.
- Latham, G.P., & Yukl, G.A. (1975). A review of the research on the application of goal setting in organizations. *Academy of Management Journal*, 18(4), 824-845.
- Lee, C., & Earley, P. C. (1992). Comparative peer evaluations of organizational behavior theories. *Organization Development Journal*, 10, 37-42.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration. In J. M. Hunt (Ed.), *Personality and the Behaviors Disorders (Vol.1)*. New York: Ronald.
- Locke, E. A. (1966). The relationship of intentions to level of performance. *Journal of Applied Psychology*, 50, 60-66.
- Locke, E. A. (1967). The motivational effects of knowledge of results: Knowledge or goal- setting? *Journal of Applied Psychology*, 51, 324-329.
- Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3, p 157-189.
- Locke, E. A. (1977). The myths of behavior mod in organizations. *Academy of Management Review*, 2, 543-553.
- Locke, E. A. (1982). Relation of goal level to performance with a short work period and multiple goal levels. *Journal of Applied Psychology*, 67(4), 512-514.
- Locke, E.A. (2001). Self-set goals and self-efficacy as mediators of incentives and personality. See Erez & Kleinbeck (2001), 13-26.
- Locke, E.A. & Bryan, J. F. (1968). Goal-setting as a determinant of the effect of knowledge of score on performance. *American Journal of Psychology*, 81, 398-406.
- Locke, E. A., Chad, D., Harrison, S., & Lustgarten, N. (1989). Separating the effects of goal specificity from goal level. *Organizational Behavior and Human Performance*, 43, 270-287.
- Locke, E. A., Frederick, E., Buckler, E., & Bobko, P. (1984). Effect of previously assigned goals on self-set goals and performance. *Journal of Applied Psychology*, 69, 694-699.

- Locke, E.A. & Latham, G.P. (1984). *Goal setting: A motivational technique that works*. Englewood Cliffs, NJ: Prentice-Hall.
- Locke, E.A. & Latham, G.P. (1990). *A theory of goal setting & task performance*. Englewood Cliffs, NJ: Prentice Hall.
- Locke, E.A. & Latham, G.P. (2002). Building a practically useful theory of goal setting and task motivation. *American Psychologist*, 57(9), 705-717.
- Locke, E.A. & Latham, G.P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science*, 15(5), 265-268.
- Locke, E.A., Latham, G. P., & Erez, M. (1988). The determinants of goal commitment. *Academy of Management Review*, 13, 23-39.
- Locke, E. A., Mento, A. J., & Katcher, B. L. (1978). The interaction of ability and motivation in performance: An exploration of the meaning of moderators. *Personnel Psychology*, 31, 269-280.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1960-1980. *Psychology Bulletin* 90(1), 125-152.
- Lord, R. G., & Hanges, P. J. (1987). A control system model of organizational motivation: Theoretical development and implied implications. *Behavioral Science*, 32, 161-178.
- Miner, J. B. (1984). The validity and usefulness of theories in an emerging organizational science. *Academy of Management Review*, 9, 296-306.
- Miner, J. B. (2003). The rated importance, scientific validity, and practical usefulness of organizational behavior theories: A quantitative review. *Academy of Management: Learning Education*, 2, 250-268.
- Mitchell, T. R., & Daniels, D. (2003). Motivation. *Handbook of Psychology*, 12: *Industrial Organizational Psychology*, ed. W. C. Borman, D. R. Ilgen, R. J. Klimoski, 225-254. New York: Wiley.
- Naylor, J. C., Pritchard, R. D., & Ilgen, D.R. (1980). *A theory of behavior in organizations*. New York: Academic Press.
- Ordonez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009). Goals gone wild: The systematic side effects of overprescribing goal setting. *Academy of Management Perspectives*, Feb., 6-16.
- Pinder, C. C. (1998). *Work motivation in organizational behavior*. Englewood Cliffs, NJ: Prentice Hall.

- Pritchard, R.D., Roth, P.L., Jones, S.D., Galgay, P.J., & Watson, M. D. (1988). Designing a goal-setting system to enhance performance: A practical guide. *Organizational Dynamics*, 17(1), 69-78.
- Quinones, M. A., Ford, J. K., & Teachout, M. S. (1995). The relationship between work experience and job performance: A conceptual and meta-analytic review. *Personnel Psychology*, 48, 887-910.
- Rothkopf, E. Z., & Billington, M. J. (1975). A two-factor model of the effect of goal descriptive-directions on learning from text. *Journal of Educational Psychology*, 67, 692-704.
- Ryan, T. A. (1970). *Intentional behavior*. New York: Ronald Press.
- Schmidt, F.L., Hunter, J.E., Outerbridge, A.N., & Goff, S. (1988). Joint relation of experience and ability with job performance: Test of three hypotheses. *Journal of Applied Psychology*, 73 (1), 46-57.
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, 124(2), 240.
- Stedry, A. & Kay, E. (1966). The effects of goal difficulty on performance: A field experiment. *Behavioral Science*, 11(6), 459-470.
- Taylor, J. G. & Smith, P. C. (1956). An investigation of the shape of learning curves for industrial motor tasks. *Journal of Applied Psychology*, 40, 142-149.
- Tosi, H. L., & Carroll, S. J. (1968). Managerial reaction to management by objectives. *The Academy of management Journal*, 11(4), 415-426.
- Tukey, J. W. (1977). *Exploratory Data Analysis*. Boston: Addison-Wesley.
- Vance, R. J., Covert, M. D., MacCallum, R. C., & Hedge, J. W. (1989). Construct models of task performance. *Journal of Applied Psychology* 74(3), 447-455.
- Vroom, V. (1964). *Work and motivation*. New York: Wiley.
- Wood, R. E. & Locke, E. A. (1990). Goal setting and strategy effects on complex tasks. In B. Staw & L. Cummings (Eds.), *Research in Organizational Behavior* 12, 73-109, Greenwich, Ct: JAI Press.
- Wood, R. E., Mento, A. J., & Locke, E. A. (1987). Task complexity as a moderator of goal effects: A meta-analysis. *Journal of Applied Psychology*, 72(3), 416-425.

- Wright, P. M. (1992). A theoretical examination of the construct validity of operationalizations of goal difficulty. *Human Resource Management Review*, 2(4), 275-298.
- Wright, P. M., Hollenbeck, J. R., Wolf, S., & McMahon, G. C. (1995). The effects of varying goal difficulty operationalizations on goal setting outcomes and processes. *Organizational Behavior and Human Decision Processes*, 61(1), 28-43.
- Zoltners, A. A., Sinha, P., & Lorimer, S. E. (2006). Match your sales force structure to your business life cycle. *Harvard Business Review* 84, 80-89.

VITA

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