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Explaining the Effects of Pay Variation on Individual Outcomes

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by

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ABSTRACT

Compensation is an area of research rife with debate among experts. These debates are primarily concerned with the effectiveness of pay-for-performance. The pay variation and performance relationship is a subset of this research where disagreement and inconclusive findings are common. Is pay variation conducive to higher performance or is pay compression ideal? This study contributes to the pay variation and performance debate by focusing on performance-based pay variation and addressing fundamental assumptions of prior work.

Past research has treated pay variation as a proxy for allocation rules and incentive intensity. Separating these two constructs rather than confounding them provides a more comprehensive treatment. This study addresses the effects of these two policies, incentive intensity and allocation rules, as separate, independent influences on performance outcomes. Incentive intensity is treated as a range of potential pay outcomes, whereas the allocation rule is an approach to distributing rewards either based on individual contribution or equally to members of a group. While theories predict individual level performance is affected by pay variation, tests of these theories are typically at the organizational level. In this study, the effects of pay variation policies are tested at the individual level using an experimental design.

In addition to testing the relationship between pay variation policies and individual performance, expectancy theory as an explanatory framework is explored. Allocation rules and incentive intensity are predicted to affect the motivational mechanisms described by expectancy theory, which in turn influence individual motivation and performance.

Results of a real pay/real effort experiment provide evidence that allocation rules affect objective individual performance while changes in incentive intensity are not significant in predicting objective performance. Objective performance is significantly higher in equity

allocation rule conditions than in equality allocation rule conditions. In addition, expectancy theory components are affected as predicted; these components are positively related to motivation, and motivation is positively related to both subjective and objective individual performance measures.

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CHAPTER 1

STATEMENT OF THE PROBLEM

Human behaviors indicate that money matters to people. Examples abound. Around 50 percent of Americans play the lottery each year (Kearney, 2005, p. 2274), hoping for a large monetary windfall. Enron executives deceived investors for money (Sims & Brinkman, 2003). Money is instrumental in fulfilling physiological needs through the purchase of goods and services; it is also viewed as a measuring stick for success. Interestingly, *pay* is especially meaningful to people. Devoe, Pfeffer, and Lee (2013) conducted an experiment on the importance of money, finding that the importance of money increased as pay increased for labor, but the importance did not differ as pay increased when payments were randomly determined. In studying the performance effects of pay, Nyberg, Pieper, and Trevor (in press) reported that pay-for-performance increased future employee performance. The accumulated evidence provides a strong argument that money, and specifically pay, has important implications for human attitudes and behaviors. The way a firm chooses to allocate money through pay (i.e., the firm's compensation policies and practices) is likely to have meaningful effects. Understanding these effects represents an important area of the human resources management literature.

It is surprising, then, how little is known about pay. Findings are inconclusive and rigorous empirical tests are missing in many of the most important compensation areas (Risher, 2012). This lack has led to substantial ongoing debate in the field of compensation. For example, Gupta and Shaw reviewed the accumulation of research on pay, and stated "Financial Incentives *are* Effective!!" (1998, p. 26) while Kohn (1998) responded that paying for performance was "behaviorist dogma" (1998, p. 27). This debate continues with Daniel Pink, from a well-known TEDTalk on financial incentives (Pink, 2009), arguing that pay is an

ineffective motivator and scholars writing rebuttals to his assertions (Gupta & Conroy, 2013; Ledford, Gerhart, & Fang, 2013).

The nature of the relationship between pay variation and performance has also been at the center of an ongoing academic debate in the compensation literature. Pay variation is the extent of pay differences across employees and jobs in organizations, and is commonly measured as pay dispersion or pay range (Gupta, Conroy, & Delery, 2012; Trevor, Reilly, & Gerhart, 2012). Scholars working in this area of research have proposed competing arguments to explain pay variation's relationship with firm performance. On the one hand, it has been suggested that pay must sufficiently vary based on performance across organizational members to encourage desired behaviors, indicating that greater variation has positive effects on firm performance (Gupta et al., 2012; Kepes, Delery, & Gupta, 2009). On the other hand, it has been argued that high levels of pay variation lead to feelings of deprivation and other negative employee reactions, meaning minimal differentiation is superior for ensuring high performance outcomes (Bloom, 1999; Pfeffer & Langton, 1993).

Published evidence supports both views. Some research indicates that pay compression has a positive influence on performance outcomes (Bloom, 1999; Ensley, Pearson, & Sardeshmukh, 2007) and other work reports pay dispersion is more desirable (Firth, Leung, & Rui, 2010; Heyman, 2005). Thus, empirical evidence has not sufficiently provided an answer regarding the influence of pay variation on performance, reporting both negative (e.g., Martins, 2008) and positive (e.g., Lee, Lev, & Yeo, 2008) relationships. This unresolved debate has important implications because it leads to inconsistent practitioner guidance and disparate evidence for pay applications of theoretical frameworks.

A thorough review of the pay variation literature points to several existing assumptions that limit progress (Conroy, Gupta, Shaw, & Park, in press). One issue is that pay variation has been confounded with concepts of equity and equality. Specifically, equality and equity arguments have been applied to explain pay variation's relationship with performance. This confounding has occurred in various ways. A common approach is to suggest that pay variation represents an equality to equity spectrum, such that low pay variation represents equality and high pay variation represents equity (Pfeffer & Langton, 1993). Initial theorizing about pay variation invoked equity (i.e., distributions of pay to employees based on individual contribution) and equality (i.e., distributions of pay to employees based on group membership) allocation rule arguments, hypothesizing differential effects of high and low pay variation using these arguments. The allocation rule logic applied was that when equity allocation rules were in place (operationalized as high pay variation), individuals would be more individually focused than when equality allocation rules were in place (operationalized as low pay variation) (Pfeffer & Langton, 1988, 1993). An implicit assumption that is made when applying this argument to pay variation is that pay variations are based on individual contributions (e.g., individual performance). This assumption is flawed in that pay variations are certainly not always based on individual performance. For example, Kepes et al. (2009) reported that some pay variation was politically-based.

Another approach to confounding pay variation with equity and equality concepts is the treatment of pay variation as an indication of *inequity*, such that increasing the size of pay differentials is an inequitable practice. In other words, this approach suggests that creating large differentials creates feelings of inequity among employees. This is also problematic. If pay

differences are based on performance, individuals are likely to view high pay variation as more equitable than low pay variation (Werner & Ones, 2000).

Together, these examples illustrate that equity and equality should not be confounded with pay variation. The confounding of equity and equality with pay variation is a serious problem (Trevor et al., 2012). Disambiguating equity and equality from pay variation may allow for theoretical progress in explaining pay variation's effects on individual and firm outcomes. This represents one of the purposes of this investigation.

Another limitation of prior work is that cross-level issues have rarely been addressed in detail theoretically or empirically. Specifically, the pay variation and firm performance relationship is tested most often from a single level perspective (Conroy et al., in press). Defined as *the pay differences across jobs and individuals*, the construct itself is typically measured at the firm level (Gupta et al., 2012). For example, researchers assess the pay of multiple jobs or individuals in an organization and combine these values into a firm level measure, such as the gini coefficient (Bloom, 1999), the coefficient of variation (Pfeffer & Langton, 1993), or the range (Kepes et al., 2009). Based on this construct definition and measurement approach, pay variation represents a firm level construct.

The firm level pay variation construct is tested to assess its effects on other firm level constructs, with the ultimate dependent variable of interest being organizational performance (e.g., Shaw, Gupta, & Delery, 2002). But this firm level relationship is explained by applying individual level theories. This represents a mismatch between theoretical and empirical specifications. For example, equity theory (Adams, 1963, 1965) and motivation theories (e.g., expectancy theory, Vroom, 1964; tournament theory, Lazear & Rosen, 1981) are used to explain the organizational implications of pay variation. That is, it is proposed that pay variation

influences individual motivation and attitudes (e.g., Kepes et al., 2009). These individual reactions are then assumed to be additive from the individual to the firm level to explain firm performance. The theorized causal relationship is pay variation→individual performance→organizational performance, but the empirical test is often simply of the pay variation→organizational performance relationship.

Despite the use of individual level theory to explain this firm level relationship, there is little *empirical* work in the management literature addressing what is happening at the individual level in response to pay variations. The economics literature has some work in this area. For example, Harbring and colleagues asked participants to choose their level of "work intensity" or "effort" on a one to 100 scale in different pay spread conditions (Harbring & Irlenbusch, 2011; Harbring & Luenser, 2008). The researchers reported that effort levels chosen were higher, on average, when the spread was wide than when it was narrow (Harbring & Irlenbusch, 2011; Harbring & Luenser, 2008). Abeler, Kube, Altmann and Wibral (2010) reported that effort levels chosen on a one to ten scale were higher, on average, for individuals assigned to conditions where pay could vary within dyads than for individuals assigned to conditions where pay could not vary within dyads.

This research is valuable as it addresses individual responses to pay variation issues; however, these studies have limitations. The primary limitation is that these studies are not real effort studies. The dependent variable is a choice of effort level variable rather than an actual effort or performance level. There is not a true performance dependent variable. Furthermore, these studies do not address many of theoretical mechanisms believed to explain the relationship between pay variation and performance (e.g., expectancy theory components).

Since most work empirically addressing pay variation issues is at the firm level and pay

variation theories are at the individual level, it is necessary to begin work that tests more appropriate models. Addressing the assumption that pay variation affects individual performance represents another purpose of this study. Using a study design that creates a real performance situation, this investigation extends tests completed in economics. The fundamental assumption related to individual level reactions, specifically performance, is explored.

This analysis is focused on individual performance outcomes because this outcome is the primary individual-level explanation for positive effects of pay variation on firm outcomes. That is, when pay variation is performance-based, there is an assumption that larger pay differences based on performance will increase individual motivation and this will increase performance. Most empirical studies skip the individual level altogether and those that do not tend to skip over motivation. Thus, in addition to studying the basic effect of pay variation on individual performance, motivational mechanisms are explored in this study.

A final limitation of prior research is that the methods used in most management research on pay variation have prevented causal inference despite the assumption that pay variation, as a representation of firm policies, is the independent variable and performance is the dependent variable. Foundational articles in the pay variation literature were in organizational settings with non-experimental designs (e.g., Pfeffer & Langton, 1988, 1993). This work provided external validity and indicated that there exists a pay variation and performance relationship in some form. This approach, however, has not established the validity of causal inferences. Without the causal connection, theorizing and development are stalled. For example, arguments that pay variation *causes* individual performance outcomes are theoretical, but have not been supported by sufficient empirical evidence. Considering the inconsistencies in the findings of this literature, it is important to establish the causal foundations of pay variation's influence.

Therefore, the third purpose of this study is to address the assumption that there is a causal relationship between pay variation and individual performance.

In sum, this study is focused on assumptions that have gone unaddressed and untested in prior investigations of pay variation by (a) differentiating the pay policies that contribute to pay variation, (b) making predictions about individual motivation and performance outcomes of pay variation, and (c) conducting an experimental test of these predictions. A broad range of motivation theories are discussed, including expectancy theory (Porter & Lawler, 1968; Vroom, 1964), tournament theory (Lazear & Rosen, 1981), equity theory (Adams, 1963, 1965), and relative deprivation theory (Crosby, 1976), to fully understand construct definitions and prior research; expectancy theory is chosen as the organizing framework to understand individual motivational responses to varied pay conditions. Due to the breadth of the pay variation definition, boundary conditions are established. Only pay variations related to performance are considered.

Hypotheses are tested in a laboratory setting with an experimental design to allow for causal inferences. This approach has a number of important benefits. Using random assignment and controlled manipulations strengthens internal validity (Shadish, Cook, & Campbell, 2002). Non-experimental, correlational research designs are more common to pay variation research, but these designs are limited because they lack these two critical design characteristics. The experimental research design makes it possible to look at objective performance outcomes of pay variation-related strategies. In field research, it is often difficult to assess employee performance levels (since performance appraisals are driven at least partially by non-performance factors, Cleveland & Murphy, 1992). In the laboratory, objective performance criteria can be measured to determine performance levels. A general lack of real pay/real effort studies of compensation

policies makes this endeavor especially worthwhile. Addressing these assumptions can help move the pay variation literature forward, beyond simple tests of positive or negative relationships, to a more nuanced approach. Pay variation has been inconsistently tied to concepts of equity and equality. By exploring this issue, I suggest pay variation should not be viewed as an equity/equality proxy. In this study, allocation rules, where the equity and equality distinction is appropriate, are separated from incentive intensity (the relative size of pay-for-performance as compared to base pay, Bamberger & Levi, 2009), the extent to which pay can vary depending on performance. This distinction allows for more nuanced theorizing regarding the theoretical mechanisms that explain how pay variation and allocation rules influence individual motivation and performance. Establishing the causal relationship between these variables provides evidence that can strengthen arguments applying individual level theory to explain pay variation effects. Expectancy theory has recently gained popularity in the pay variation literature (e.g., Downes & Choi, 2014; Gupta et al., 2012). Testing its theoretical mechanisms provides evidence of the validity of the expectancy theory application to pay variation.

From a practical standpoint, better understanding individual motivation and performance is valuable for managers. This study focuses mainly on entry-level, low skill tasks where performance is identifiable (i.e., can be measured), so the greatest benefit of this research is for organizations that have a workforce engaged in this type of work. Managers are often encouraged to make large distinctions among individual employees within workgroups. This study can provide further information that may be helpful when making these allocation decisions for primarily entry-level, low skill employee groups. Are large distinctions for individual employees within groups preferable or are small distinctions better? Are large between group distinctions motivational? For managers concerned with performance

implications of pay approaches, this study provides evidence regarding the effects of pay policies for entry-level jobs. Organizational decision makers can also benefit from findings that clarify the influence of pay policies on employee outcomes. While contextual variables that are not included in this study are also important for consideration (see for example, Gupta & Conroy, 2013), this study sheds light on two policies that are within the control of firm management.

In sum, this research investigates pay variation-related policies, allows for causal inference in a real pay/real effort study, and explores critical assumptions in the pay variation literature. All of these issues are important aspects of this complex research area. The variables under investigation are HR practices over which managers have some control. This study can benefit both the academic literature and managerial practice.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Overview

The first section of this chapter is devoted to reviewing the pay variation literature, including a definition of the pay variation construct and a description of the theories applied to explain the pay variation and performance relationship. Empirical findings are reviewed and limitations of prior work are noted. Following this review, a relationship between pay variation-related policies and individual performance is hypothesized. Expectancy theory is then applied to develop a model that predicts the individual motivational mechanisms that explain the performance outcomes of pay variation-related policies.

Construct Definition

Pay variation is the extent of differentiation in pay made within an organization. This definition is certainly broad. This breadth can prevent precision in theorizing around the sources and effects of pay variation. Recent work has suggested distinctions made about the pay variation construct can improve theorizing (Gupta et al., 2012). When these distinctions are made, the sources of pay variation become clearer. The effects of pay variation can then be theorized with sources and types in mind. Here, the construct distinctions suggested by Gupta et al. (2012) are discussed.

A review of prior work on pay variation points to three main types of pay variation that are studied in the literature. The types are horizontal, vertical and overall (Gupta et al., 2012). Before addressing these types, it is important to note what is meant by the term pay. Here, pay is defined as monetary compensation for work. Pay comes in many forms. Common forms are base pay (the wage paid for the job), pay raises (increases in base pay provided over time) and

bonuses (one time payments). An individual's annual salary at any given moment includes base pay and the accumulation of wage adjustments (if pay reductions are assumed not to occur, these adjustments can be viewed as pay raises). These annual salary amounts are common forms of pay included in pay variation measures. For example, in computing pay variation measures, researchers focused on sports teams have used the annual salaries of athletes (Depken, 2000; Gee & Wen-Jhan, 2008) and researchers focused on education have used the annual salaries of teachers (Heutel, 2009; Trevor & Wazeter, 2006). Understanding the forms of pay is helpful in thinking about the types of variation.

Horizontal Pay Variation

Horizontal pay variation is variation in pay across individuals within a job (Gupta et al., 2012; Siegel & Hambrick, 2005). Aligning this definition with empirical measures, this type of pay variation can be assessed by collecting a pay value (e.g., salary, bonus) for every employee within a job or job category, then creating a measure of the disparity. As noted, an employee's annual salary can be viewed as inclusive of two main components, base pay and the accumulation of pay raises (base + raises). The job is constant. So, base pay is constant since it is the wage paid for the job. This means that the differences in pay are the differences in wage adjustments.

It is complicated to determine the precise source of these differences. Because the job is constant, we can assert that the differences in pay are driven mainly by differences in individuals. These differences include seniority, performance, knowledge, skill, and political connections. They could also include factors considered at hire, such as negotiation skills and gender. Despite its complexity, understanding the source of the variation is important to predicting its effects. For example, Kepes et al. (2009) isolated performance sources and

political sources of horizontal pay variation and reported that pay variations with performance sources were positively related to workforce performance; pay variations with political sources were negatively related to workforce performance. In this example, performance and politics were the sources of the pay differences among employees in the job. Pay variation was the extent that performance and politics were rewarded. That is, pay variation is associated with the size of pay differences associated with a source of pay (i.e. reward intensity).

Vertical Pay Variation

Vertical pay variation is variation in pay across jobs. Its optimal operationalization would be to collect a value for each job in the organization. This value could be the lower limit of each job level or the midpoint for a job level. In market pricing systems, it could be the value associated with each market priced job (Milkovich, Newman, & Gerhart, 2014). It could also be estimated using the average, median or mode value associated with each job. This array of values can then be used to create a disparity measure. Here, the pay values are a result of the difference in the value associated with each job for the organization.

Vertical pay variation represents the firm's philosophy on the values of various jobs. For example, in a job evaluation system, each job is assigned points based on its assessment compared to compensable factors (Milkovich et al., 2014). These compensable factors are chosen by organizational leadership to represent what is important to the firm. Because these values are associated with jobs rather than people, differences in the values can be explained by differences in the job, such as differences in the labor market for the job (e.g., market pricing structures) or differences in job evaluations (e.g., job evaluation systems). Brown, Sturman, and Simmering (2003) studied the issue of vertical pay variation in hospitals by creating a measure of pay dispersion (using the gini coefficient) across nine job categories. In the vertical context, pay

variation does not represent an intensity of reward for individual behaviors as directly as it does in horizontal pay variations. Rather, as in the case of the Brown et al. (2003) study, it is representative of the difference in pay structures, specifically elitist (where there is great dispersion among jobs) versus egalitarian (where there is little difference among jobs).

Overall Pay Variation

The last type of pay variation is overall pay variation. This variation includes both vertical and horizontal variation. Overall pay variation involves combining both job differences and individual differences. It is inclusive of the sources of pay for individuals and the sources of pay for jobs. This means it is representative of both intensity of individual reward systems and elitist/egalitarian pay structures. Because of the variety of factors that can explain the differences in pay, teasing out the explanations for overall pay variation is difficult. Still, this type of variation has been at the center of much pay variation research (Belfield & Marsden, 2003; Clark, Kristensen, & Westergard-Nielsen, 2009; Heyman, 2005; Tsou & Liu, 2005). Unfortunately, findings are difficult to interpret because the reasons for the variation are rarely specified in the empirical models.

Summary

Based on the above review of the pay variation construct, it is clear that research in this area has two primary construct definition issues that must be clarified early in the research process. One is that the type of pay variation must be specified. The second is that the source (also called the "basis" of pay, Gupta et al., 2012) of the variation must be clear. In this study, I focus on *performance-based horizontal pay variation*. My focus on performance sources of pay differences allows me to draw on the pay-for-performance literature and to contribute to the underlying arguments associated with the motivational effects of pay variation. Horizontal pay

variation holds the job constant. By holding the job constant, I can ensure a true performance-basis for pay differences (i.e., the source of pay variation is performance).

Theories of Pay Variation and Performance

Pay variation has attracted the interest of many disciplines, including economics, management, and finance. As such, theoretical explanations for pay variation's influence on performance are diverse. Theories that have regularly appeared in the literature include equity, relative deprivation, agency, and tournament theories. More recently, expectancy theory has received attention. While the specific definition of performance as an outcome varies in empirical studies, most of the work is primarily focused on the organizational or workforce performance outcomes of pay variation. At the same time, all of the theories are focused on individual responses as an outcome of pay variation; these responses are assumed to lead to higher level organizational and workforce performance outcomes. Here, I outline the fundamental tenets of each of these theories.

Equity Theory

Equity theory (Adams, 1963, 1965) is commonly applied in the management literature to explain the effects of pay variation on performance (e.g., Ang, Hauser, & Lauterbach, 1998; Brown, 2006; Brown et al., 2003; Carpenter & Sanders, 2004; Cowherd & Levine, 1992). This theory suggests that individuals compare their own perceived input/outcome ratios to the perceived input/outcome ratios of comparison others (Adams, 1963, 1965). *Inputs* refer to anything a person is perceived to contribute to the organization, e.g., effort, education. *Outcomes* refer to anything perceived to be received by the person from the organization, e.g., pay, promotion. Inputs and outcomes are *perceptions* of the focal person. That is, equity theory is based on each individual's view of inputs and outcomes of himself/herself and of others

viewed as relevant (i.e., referent others). To the extent ratios of inputs/outcomes between oneself and relevant others are not equal, a person is expected to experience inequity. Inequities lead individuals to experience tension that must be relieved. The way this tension is relieved depends on the type of inequity experienced.

Positive inequity (overpayment) is experienced when one feels he or she contributes less than others for the same or greater outcomes or contributes the same as others for greater outcomes. An overpayment behavioral response is to increase one's own contributions (i.e., inputs) to balance the ratio. Interestingly, in a pay context, increasing one's inputs may lead to increased future pay, making a continued imbalance in the ratio likely. Research indicates that feelings of overpayment are rare in western society (Levine, 1993; Pinder, 1998). Thus, issues of overpayment receive much less attention than issues of underpayment. Negative inequity (underpayment) is experienced when one feels he or she contributes more than others for the same or lower outcomes or contributes the same as others for lower outcomes. Research indicates that underpayment leads to negative reactions, such as reducing performance (i.e., lowering contributions, Cowherd & Levine, 1992; Levine, 1993) or leaving the situation (Adams, 1963, 1965). In sum, equity theory is an individual-level theory that considers the inputs and the outcomes of oneself and others, uses social comparisons as a fundamental building block, and suggests negative inequity can lead to problematic individual responses in organizations.

Since pay variation represents a difference in outcomes among employees, it has been proposed that greater pay variation represents greater pay inequity (Pfeffer & Langton, 1993). This "pay variation = pay inequity" is a fundamental assumption of many equity theory

applications that may not be accurate, a point addressed in the limitations section. Here, the logic, *if this assumption is accepted,* is briefly reviewed.

Pay variation represents greater variation in outcomes. When focusing on horizontal variations, the job is the same, leading to the assumption that inputs are equal. As such, employees are theorized to respond to negative inequities created by pay variation by quitting or reducing effort, both of which are expected to negatively influence performance outcomes for firms. Since overpayment beliefs are uncommon, all but those at the top of the distribution are believed to experience negative inequities. The prediction follows that greater variation increases the inequity tension experienced for most employees in a job, and that this negatively affects individual performance, and subsequent firm performance.

Relative Deprivation Theory

According to relative deprivation theory, feelings of deprivation are experiences of resentment about not having something (Crosby, 1976). Certain conditions create feelings of deprivation, and deprivation is entirely relative (i.e., social comparison-based). Seeing others with something one desires and to which one feels entitled leads to deprivation. Deprivation, as a negative feeling of resentment, can lead to negative behavioral reactions. This is especially likely when the lack of something is assumed to be outside of one's control. These negative responses could include reducing effort or retaliating against the organization.

Applications of relative deprivation theory to pay variation research are similar to applications of equity theory. Differences in pay variation are assumed to represent differences in receipt of a desirable resource (i.e., pay/money). When variations are greater, these differences are perceived to be greater, increasing the deprivation experienced by those who are not at the top of the distribution. As such, all but those at the top of the distribution are expected

to experience deprivation. This deprivation is expected to be increasingly experienced as the variation increases. Thus, high pay variation should have negative effects on most individual employees, effort should be reduced and/or counterproductive behaviors increased, and organizational performance should suffer. As with equity theory, there are problematic assumptions in this application; these assumptions are addressed in the limitations section.

Tournament Theory

Tournament theory (Lazear & Rosen, 1981) is one of the most prevalent economics theories applied to explain the performance effects of pay variation. Unlike equity and relative deprivation theories, tournament theory was specifically formulated with the intent of explaining vertical pay variations and responses to vertical pay variations. According to this theory, pay differences across levels are more motivating to those at lower levels when there are large pay gaps between jobs than when the pay gaps are small (Lazear & Rosen, 1981).

This theory suggests that greater pay differentials between jobs create competition to be the best relative performer within a job so that one can be promoted to the higher paying job. As a result of this competition and the large prize for 'winning' (i.e., getting the promotion), individuals are especially motivated to be the best performer in the group of competitors. This increased motivation, then, is proposed to explain why pay variation should be positively related to firm performance. Since this theory is specified for vertical variations, which are between-job variations, tournament theory is not an ideal theory for explaining horizontal variations (i.e., within-job variations).

Agency Theory

According to agency theory, employees are agents engaged in contracts with organizations (Jensen & Meckling, 1976). As agents, employees have their own goals and

agendas. Similarly, organizations are entities with goals and agendas. In order to ensure employees contribute to the organization's goals, the employee's goals must be aligned with those of the organization. This can be done through monitoring, in which an employee is watched and must behave in a manner consistent with the organization's expectations. It can also be done through incentives, by aligning employee incentives with the organization's interests. Introducing these incentives aligns the employee's and the organization's goals. The employee desires the pay associated with the incentive and behaves in ways to access the monetary payout associated with the incentive. Assuming incentives are aligned with the organizations goals, the use of incentives should increase organization-focused behaviors (e.g., high performance) among employees.

Applying agency theory to pay variation, increasing pay variation is assumed to represent increasing incentives (e.g., Lee et al., 2008). Through this increased use of incentives, the firm is aligning employee interests with firm interests. This results in higher employee motivation and performance, which increases subsequent firm performance. Limitations and assumptions are also present in applications and tests of agency theory. These are addressed later.

Expectancy Theory

Expectancy theory has been applied to pay research for many years (e.g., Lawler, 1973). In the area of pay variation, it has received increasing attention recently (e.g., Gupta et al., 2012; Kepes et al., 2009). Expectancy theory is based on three fundamental perceptions that individuals have regarding the exertion of effort (Porter & Lawler, 1968; Vroom, 1964). These three perceptions are combined to determine motivational force. Increasing employee motivational force toward performing well should lead to increased individual performance.

The first factor in expectancy theory proposed to influence motivation is effort to performance expectancy or E→P expectancy (Porter & Lawler, 1968; Vroom, 1964). Essentially, E→P expectancies are the answer to the individual's question, "if I exert effort, will I perform?" That is, E→P expectancies are the individual's perceptions of the probability that effort leads to performance. Lawler (1973) identified multiple factors which influence E→P expectancies, including the actual situation, past experiences, and self-esteem.

The second component in the expectancy motivation equation is performance to outcome expectancy, i.e., P→O expectancy (Lawler, 1973; Porter & Lawler, 1968; Vroom, 1964). P→O expectancies, also known as instrumentalities, answer the question, "if I perform, will it lead to outcomes?" Because there are multiple outcomes of which an individual may concern himself or herself, people can have several P→O expectancies. Pay is the primary outcome for consideration in pay research. Lawler (1973) proposed that P→O expectancies were influenced by multiple factors, including the actual P→O relationship (i.e., the objective situation), past experience, and communication from others. Much of the research on pay focuses on the P→O link because of all the links, it is likely to be most controllable for the organization ("most easily and directly influenced by organizations," Lawler, 1973, pp. 57-58). That is, an organization may develop policies to address the extent that outcomes are tied to performance and these policies are likely to directly affect P→O expectancies.

Valence refers to the value an individual places on the outcome of performance (Porter & Lawler, 1968; Vroom, 1964). As noted earlier, a number of outcomes may be considered by an individual. In addition to pay, individuals may consider outcomes such as peer relationships, respect and recognition from one's supervisor, and feelings of achievement. While there are multiple outcomes likely to be considered for any specific action, individuals can cognitively

manage only a limited number of outcomes and are likely to satisfice in making effort decisions (Lawler, 1973).

Each of the factors discussed (E→P expectancies, P→O expectancies, and outcome valences) come together to determine motivational force. The specific formulation of this relationship is: Motivation Force (MF) = E→P * ∑ (P→O * Valence of Outcome). The sum sign (∑) indicates that there are multiple outcomes for which P→O expectancies and outcome valences are assessed. All of the values associated with outcomes are added together. The multiplication signs indicate that the theory is multiplicative (Nagengast, Marsh, Scalas, Xu, Hau, & Trautwein, 2011; Vroom, 1964). That is, if either E→P or ∑(P→O*valence) equal 0 (e.g., effort is not believed to influence performance, performance will not lead to valued outcomes), then there is no motivational force and motivated effort will not occur.

It is important to note that expectancy theory is a choice-based theory. That is, it suggests individuals may have many different equations to determine which level of effort is optimal. So in a given performance situation, the individual must choose whether or not to exert effort toward the task, and if effort is exerted, how much will be exerted. In a task performance situation, the individual's level of motivation is the effort level that is chosen.

Applications of expectancy theory to explain pay variation have focused mainly on P→O expectancies and valences (Gupta et al., 2012; Kepes et al., 2009). In pay variation contexts, P→O expectancies can be interpreted as P→Pay expectancies, which are expected to be strongest when pay is performance-based. The valences associated with pay in these performance-based pay environments should be higher when there is greater pay variation because the potential rewards for high performance are of greater value compared to the outcomes of poor performance, assuming pay is valued. Specifically, pay variation based on

performance is viewed as a measure of the intensity associated with the incentive system. As a result, performance-based pay variations are theorized to be positively related to individual motivation and performance, which influences firm performance.

Empirical Findings of the Pay Variation and Performance Relationship

One set of theories suggests a negative effect of pay variation on satisfaction (i.e., equity, relative deprivation) and another set suggests a positive effect of pay variation on motivation (i.e., tournament, agency, and expectancy). Of course, I propose that it is more complicated than this (e.g., negative effects would depend on how people feel about pay differences), but here I discuss the typical treatment of these theoretical arguments in prior research.

Empirical research has dealt with this theoretical tension by describing the theories as competing arguments to explain the effects of pay variation (e.g., San & Jane, 2008). These competing arguments are then tested by assessing the pay variation and organizational performance relationship with authors reporting which effect is stronger based on the results (e.g., "Our empirical results are more in line with the 'fairness, morale, and cohesiveness' models than the 'tournament' models," San & Jane, 2008, p. 886). I review the published findings supporting each perspective, particularly those with a focus on horizontal pay variation.

Negative relationships have been reported in a variety of samples, including professional athletes (Bloom, 1999; Depken, 2000), top management teams (Fredrickson, Davis-Blake & Sanders, 2010), and faculty members (Pfeffer & Langton, 1993). Findings of a positive relationship have also been reported in a variety of samples, including professional athletes (Becker & Huselid, 1992), truck drivers (Kepes et al., 2009), and students (Harbring & Luenser, 2008). Methodological differences may illuminate these disparate results.

Negative relationships are typically found when the pay variation of interest is not performance-based or legitimate (Downes & Choi, 2014; Gupta et al., 2012). For example, Kepes et al. (2009) reported pay variation was negatively related to performance when it was based on politics. Other studies have controlled for performance-based pay, leaving only non-performance-based pay variation as the independent variable (Gerhart & Rynes, 2003; e.g., Pfeffer & Langton, 1993).

When methods ensure performance as the source of pay differences (e.g, sports samples where individual performance is clearly measured or studies where organizations report the influence of both political and performance factors in determining pay), positive relationships are often reported. For example, the Kepes et al. (2009) study reported a positive relationship with firm performance for performance-based pay variation. Trevor et al. (2012) reported that pay variations explained by individual input were positively related to team performance in the National Hockey League. Other sports samples where individual performance is the clear determinant of rewards have also supported a positive relationship. Specifically, race car drivers (Becker & Huselid, 1992), professional tennis players (Gilsdorf & Sukhatme, 2008), and marathon runners (Frick & Prinz, 2007) have all been found to increase performance as prize spreads increase.

A Critique of Prior Research

A number of limitations are apparent from the preceding review. This study aims to address many of these limitations, which are outlined below.

Pay Basis

Theoretical frameworks all point to the critical role that the performance source or basis for pay variation plays in a positive relationship between pay variation and firm performance.

For pay to be motivating, expectancy theory proposes P→O expectancy links must be high, which is essentially representative of the pay and performance link. Similarly, agency theory indicates tying pay to performance increases alignment of employee behaviors with firm performance goals. Tournament theory suggests promotion of the highest performer to the next level leads to higher individual performance. Equity theory indicates that inputs must be balanced with outcomes. Performance represents an input viewed as one of the most legitimate in a work context (Werner & Ones, 2000). Pay represents an outcome. Alignment of pay with performance should be tied to equity perceptions. Relative deprivation theory proposes that control over pay differences may alleviate feelings of negative deprivation (Crosby, 1976). From this perspective, performance-based pay may not create feelings of deprivation to the extent that an employee is able to perform the job (i.e., he or she has control over making additional money).

Despite the clear importance of the basis for pay variation, it has not been viewed as a central issue in pay variation research until recently. Empirically, many of the early models of pay variation did not ensure that performance-based pay variation was central to the analysis. Rather, it was implicitly assumed that pay variation was performance-based. In reality, pay is not always performance-based. For example, Kepes et al. (2009) reported that some pay variation was based on politics in a sample of truck drivers. Research on the determinants of wages indicates that pay is partially driven by worker productivity, but not fully (Bishop, 1987).

Part of the issue may be that it is difficult to ensure pay variation measures are performance-based. Even performance appraisals are not fully performance-based (Cleveland & Murphy, 1992). Research that makes explicit the source of pay variation both theoretically and empirically is important as work on pay variation moves forward.

Incentive Intensity versus Pay Allocation

In trying to understand pay variation's effects, a variety of pay constructs have been viewed as related and sometimes as equivalent to pay variation. Consider the arguments made above in various theoretical applications. Terminology for expectancy, agency, and tournament theory focuses on incentive intensity and pay-for-performance. Terminology for equity and relative deprivation theory tends to focus on equity and inequity. Pay variation tests are viewed as tests of equity and equality allocation approaches and/or as tests of incentive intensity. For example, one approach taken by researchers has been to propose competing arguments for a pay variation and performance relationship (e.g., San & Jane, 2008). Incentive intensity arguments based on theories such as tournament or agency theory are applied to explain a positive relationship and allocation rule arguments based on theories such as equity or relative deprivation are applied to explain a negative relationship.

The application of these terms is related to the mechanisms through which individuals are believed to respond to pay variation, i.e., fairness/equity and motivation. The fairness view based on relative deprivation (Crosby, 1976) and equity theory (Adams, 1963, 1965) has focused on terms such as equity or inequity, equality or inequality (e.g., Pfeffer & Davis-Blake, 1992). As noted, the theoretical logic is that employees interpret large gaps in pay compared to others as inequitable, which has negative performance consequences.

The motivation view based on agency (Jensen & Meckling, 1976), expectancy (Porter & Lawler, 1968; Vroom, 1964) and tournament (Lazear & Rosen, 1981) theories describes pay variation as pay-for-performance and incentive use (e.g., Franck & Nuesch, 2011). The take-away is that higher pay variation is representative of greater pay-for-performance or greater

incentive use, and this leads to higher motivation and subsequent performance for individual employees.

These two views essentially have their own language to define what pay variation represents; this leads to confusion. Are pay variation, equity, equality, inequity, inequality, pay-for-performance, and incentive intensity all addressing the same basic construct? Or are there important differences between the constructs? The latter seems more likely, as clarified below.

Pay-for-Performance and Incentive Intensity. Pay-for-performance is "pay that varies with some measure of individual or organizational performance…" (Milkovich et al., 2014, p. 686) while incentive intensity can be defined as "the overall magnitude of the incentive as a proportion of total pay" (Bamberger & Levi, 2009, p. 302; Zenger & Marshall, 2000). At first glance, it might appear that pay variation is an accurate representation of incentive intensity for performance. In reality, it is not so simple. One issue is that pay variation may or may not be performance-based (Kepes et al., 2009) as noted above.

Aside from the performance-basis issue, an additional issue is that pay variation is an aggregate measure, a snapshot of the pay distribution or range in an organization at a moment in time. Data on specific pay strategies, such as the incentive policy of the firm, may be difficult to obtain; data on the range or dispersion of pay, in some cases, is available publicly (e.g., professional sports, academic salaries). These samples have been the predominant samples of management research in this area. The pay variation measures developed from these samples are typically based on individual salaries of each member of the organization. Rather than measuring the actual pay policy of the firm, the range or dispersion in values is assumed to represent the incentive intensity of the firm. Thus, a measure of pay variation is a proxy for incentive intensity. A problem arises because this proxy includes more than simply incentive

intensity. For example, if the firm has high incentive intensity for employees in a job (i.e., there is a large amount of money that can be awarded for high performance), this will be well-represented by a pay variation measure only if there is heterogeneity in the performance criterion. If performance is homogeneous, there will be little variability in a performance-based pay variation measure. In sum, the level of variation is created by both the pay policies that are implemented in a firm as well as the heterogeneity of employees and groups on reward criteria.

The arguments made using pay-for-performance and incentives to describe the relationship between pay variation and performance are concerned mainly with individual motivation. Since pay variation acts as a measure of incentive intensity, a stronger test of these arguments would be to ensure a performance basis of pay and to isolate the incentive intensity that is driving employee motivation from heterogeneity of performance.

Equity and Equality. Foundational management articles addressing pay variation were largely rooted in equity and equality allocation arguments. Authors have argued that pay variation represents an equity allocation approach while pay compression (i.e., low pay variation) represents an equality allocation approach (e.g., Pfeffer & Langton, 1988, 1993). Findings about the pay variation and performance relationship are then used to draw inferences about equity versus equality allocation approaches to pay distribution (e.g., Bloom, 1999; Pfeffer & Langton, 1993). Table 1 lists the use of the (in)equity and (in)equality terminology in some of the most influential articles in the pay variation literature. In looking across the definitions, a number of flaws are notable.

Table 1

Prior Uses of Equality and Equity Terminology

Article	Equity/Equality Reference
Pfeffer & Langton (1988)	*Equality* and dispersion distinction treated as ends of a continuum (p. 588, 589); Dispersion treated as synonymous to *inequality* (p. 593)
Pfeffer & Langton, (1993)	"Pay compression or even *pay equality* is desirable to promote harmonious social relations" (p. 382); Salary dispersion is described as a measure of *inequality* (p. 391)
Bloom, (1999)	High dispersion treated as *unequal* allocation, which is treated as the same as *inequity* (p. 26, p. 38)
Bloom & Michel, (2002)	Dispersion treated as synonymous with *inequality* (p. 33)
Shaw, Gupta, & Delery, (2002)	Salary dispersion is described as a measure of *inequality* (p. 500)
Trevor, Reilly, & Gerhart, (2012)	Argue that *inequality* and *inequity* are often confounded in prior work (p. 585)

One flaw occurs when pay variation is treated as a proxy for an equity allocation approach (i.e., the distribution of rewards based on individual contributions). In reality, there are different issues that should be considered when theorizing around allocation approaches versus pay variations. Equating the two involves the assumption that high pay variation is representative of equity allocations. However, pay variation in organizations may not be the result of legitimate sources (Downes & Choi, 2013; Gupta et al., 2012; Kepes et al., 2009). Perceptions of equity tend to be higher when pay differences are the result of performance differences (Werner & Ones, 2000) versus other sources. In order for high pay variations to be symbolic of equity allocation approaches, it is necessary that the distributions are based on performance or other bases that are viewed by employees as legitimate (Downes & Choi, 2013).

In fact, Leventhal's (1976) conceptual definition of equity allocation rules defined them as distributions within a group based on individual contributions. If pay variation is high, pay differences may be related to individual contributions, but they may not. Thus, the suggestion that high pay variation is a proxy for an equity allocation rule is tenuous.

Another flaw with suggesting equity is the same as high pay variation and equality is the same as low pay variation is that allocation rules may vary from work group to work group. So, while pay variation is largely conceptualized as an organizational phenomenon, allocation rules are not necessarily conceptualized at this level. Wang and He suggested this distinction in their work developing a team pay model:

> "Note that most studies on pay compression and pay differentiation are conducted at the firm level, whereas team-based versus individual-based compensation plans are discussed at the team level. For nondedicated cross-functional team members, an equal team compensation plan could result in pay differentiation at the firm level..." (2008, p. 763)

An equity allocation approach where high performers are rewarded differentially than low performers may be the preferred approach by some managers while others may be more prone to equality allocations. Firms may have large pay differentials across the organization, despite equal allocations by some managers. In fact, a firm with high incentive intensity based on group performance may have high pay variation despite an equality allocation rule approach. It seems unreasonable to assume pay variation is a fair representation of the equity/equality distinction.

Further complicating the application of equity and equality arguments to pay variation research is that some authors have treated equity and equality as synonymous (rather than a antonymous as described above) such that high pay variations are viewed as inequality, and this is assumed to be inequitable (e.g., Bloom, 1999, noted by Trevor et al., 2012). Specifically, pay variation represents varied pay outcomes among employees, leading to the proposition that greater pay variation represents both greater pay inequality and inequity (Pfeffer & Langton,

1993). These pay variation arguments assume that different outcomes (different pay levels) create inequity, but they ignore the role of inputs (Gupta et al., 2012). Inputs are fundamental in equity considerations (Adams, 1963, 1965). If pay differences are performance-based, the inputs are different when high pay variation exists. Greater variation indicates larger pay differences based on inputs, something that equity theory implies would lead to feelings of equity, not inequity. In fact, research suggests inequity is perceived when wages are the same but performance varies (Werner & Ones, 2000). An assumption that pay variation is representative of both inequity and inequality is inaccurate when pay is performance-based.

In sum, at least two faulty assumptions of equating equity and equality arguments to pay variation exist, 1) that equity and equality are two ends of the pay variation spectrum, and 2) that pay variation is equivalent to both inequity and inequality. Application of these assumptions may simplify the study of firm pay policies by linking pay variation to equity/equality allocation theoretical arguments. However, considering the issues raised here, the inconsistent findings of this research stream, and the importance of construct clarity to the management discipline, it is important to explore these issues, and empirically separate the constructs.

Methodological Approach

Methodologies used in the bulk of pay variation research have approached both pay variation and performance as firm level constructs. On the one hand, this provides ease in study design and analysis as the variables are at the same level of analysis; these studies are also field studies, allowing for stronger external validity. On the other hand, this approach misaligns theoretical applications and empirical models.

All five of the theories described suggest individual level responses can explain the effects of pay variation on firm performance; yet, individual level responses have received

limited attention. These theories suggest that the causal chain is: pay variation related policies (measured as pay variation) → individual motivation and performance (unmeasured) → organizational performance (measured as workforce productivity or firm financial performance). There is a need to explore the assumption that these policies influence individual performance. The theoretical mechanisms described by motivation theories, such as valences and P→O expectancies, have not been tested in response to pay variations. In order to understand if and how these policies influence individuals, these mechanisms also require attention.

It should be noted that in the economics literature, experimental design has been more common than in the management literature. The findings of this work are interesting and suggest value in this approach. For example, Abeler et al. (2010) reported that when wages were allowed to vary, students intended to exert greater effort (representing high motivation). Harbring and Luenser (2008) found that student effort intentions were higher for high rather than low prize spreads. Unfortunately, the methods used in these studies are limited. One issue is that effort allocation is an intention rather than actual effort, i.e., selected performance when performance is not actually required or selected effort when effort is not actually required. This does not fully address the individual performance response of interest. This work also tends to take a tournament theory focus (Harbring & Irlenbusch, 2008, 2011; Harbring & Luenser, 2008), where individuals compete with others to win the prize, rather than creating a group environment where there are some common goals among individuals.

Summary and Implications

This study is designed to deal with the limitations described as a way of moving the pay variation literature forward. As noted earlier, I make explicit two main construct boundaries in

my investigation, 1) a focus on horizontal pay variation only and 2) a focus on performance-based pay variation only. The rest of this investigation follows with these constraints in place.

The preceding discussion also indicates two compensation policies especially relevant to the study of pay variation and its consequences, 1) equity and equality allocations, and 2) incentive intensity. Thus, in this study, I define and operationalize these constructs separately, which allows for separate theorizing for each.

I define equity and equality within the allocation rule framework (Leventhal, 1976). Allocation rules guide the distribution of rewards in a group; equity and equality rules are predominant types of allocation rules (Leventhal, 1976). An equity allocation rule exists when pay is distributed within a group based on individual contributions to the group; an equality allocation rule exists when pay is distributed within a group equally.

Incentive intensity is the variable proportion of pay. Specifically, I conceptualize this in terms of the pay-for-performance range of pay for engaging in work. Larger ranges represent greater incentive intensity since there is an increased difference between what is paid for low or average performance and what is paid for high performance. A pay range involves two main considerations. Pay floors are the amounts that will be paid regardless of performance (Brown & Huber, 1992). That is, floors are determined by the value of the job to the organization, and are independent of performance. As pay for the job, differences in floors are likely to be tied to economic concerns such as labor supply and demand. Floors can be low where one makes very little for performing poorly or high where even low performance results in a high level of compensation. Pay ceilings are an aspirational amount. That is, a pay ceiling is the amount that is possible, that could be paid, if performance is high. Pay ceilings set a cap on what is possible. Together, the pay floor and the pay ceiling create the pay range (Kepes et al., 2009), or the range

of possible pay outcomes depending on performance. This pay range represents incentive intensity, or the proportion of pay that is variable.

In sum, an allocation rule can be viewed as a decision made regarding distributions to individual members, while pay range is the size of differences established by pay-for-performance plans. These two factors coexist in a compensation system when group performance creates a pool of rewards to be allocated. Specifically, the potential amount of money to be distributed to members of a group depends on the *pay range* of the firm's pay-for-performance plan. The way this reward pool is distributed depends on allocation rules. In the case of equality distributions, individual pay outcomes depend on the pay range and the group's performance; in the case of equity distributions, individual pay outcomes depend on the pay range and the individual's performance (though it should be noted that group performance is relevant to the creation of the pool). Figure 1 depicts how these issues have been treated in the past and the treatment approach used in this study. Table 2 juxtaposes the two policies.

The model built and tested in this study is focused on performance-based horizontal pay variation and separates pay range and allocation rule constructs as different policies. Definitions of important terms, as defined in prior research, are included in Table 3 for definitional clarity. These are the definitions used in this study.

Figure 1

Pay Variation, Incentive Intensity, and Allocation Rules

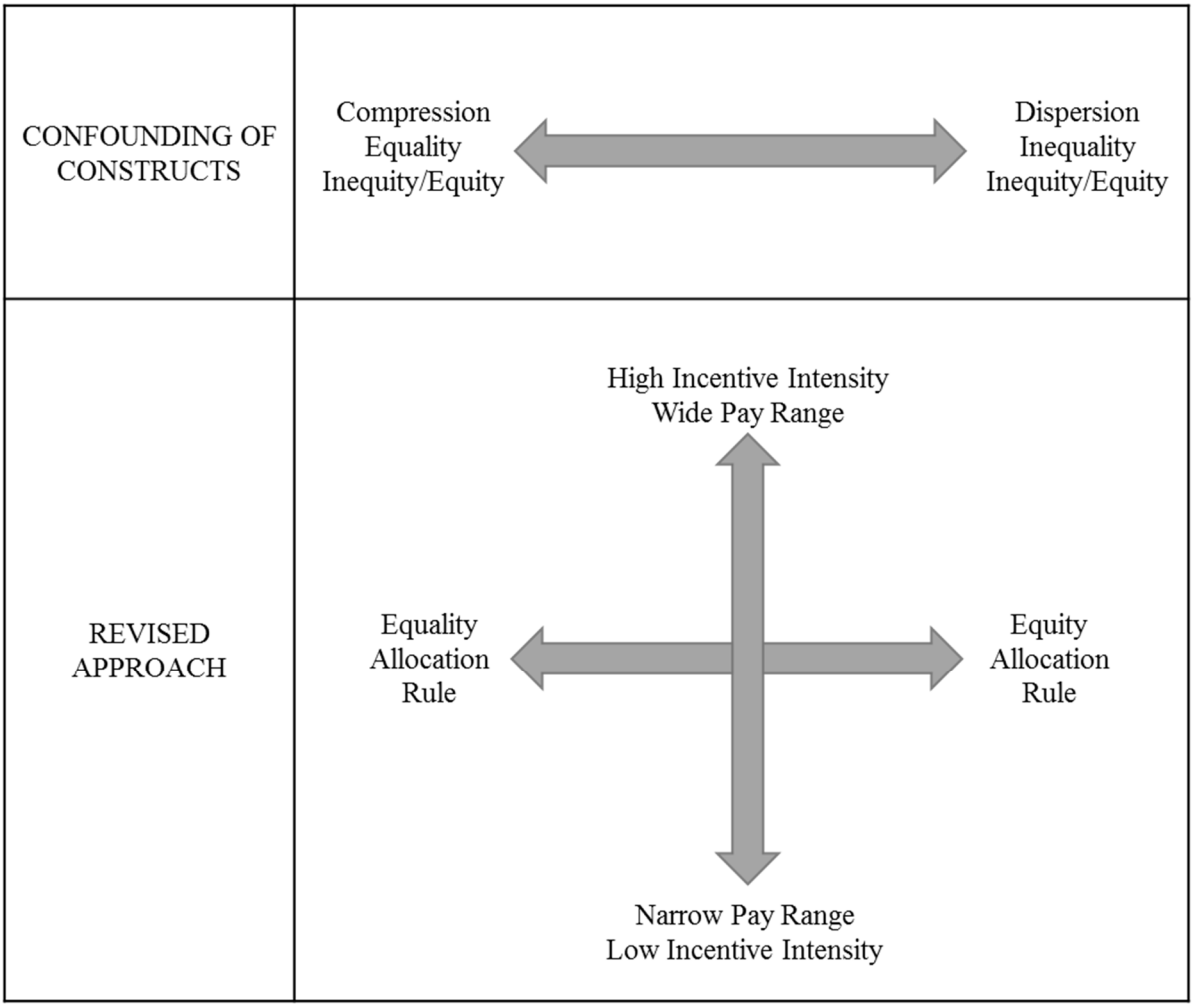


Table 2

Pay Range and Allocation Rules

Pay Range	Equality Allocation Rule	Equity Allocation Rule
Narrow Pay Range (Low Incentive Intensity)	Narrow range of potential pay outcomes; Allocated equally across group members	Narrow range of potential pay outcomes; Allocated based on individual contributions
Wide Pay Range (High Incentive Intensity)	Wide range of potential pay outcomes; Allocated equally across group members	Wide range of potential pay outcomes; Allocated based on individual contributions

Table 3

Definitions

Term	Definition
Ability	The combination of knowing what to do and how to do it (Campbell, 1990)
Allocation Rule	"principles or values as the basis for distributing outcomes" (Kabanoff, 1991, p. 417; Leventhal, 1976)
Effort→ Performance Expectancy	(E→P) "the perceived likelihood that effort will result in the desired performance" (aka, expectancy, Nyberg et al., in press, p. 4; Vroom, 1964)
Equality Allocation Rule	"give all recipients the same, regardless of their contributions" (Leventhal, 1976, p. 94)
Equity Allocation Rule	"outcomes are distributed according to input" (Kabanoff, 1991, p. 418) "distribute rewards and resources in accordance with recipients' contributions" (Leventhal, 1976, p. 94)
Incentive Intensity	"the overall magnitude of the incentive as a proportion of total pay" (Bamberger & Levi, 2009, p. 302; Zenger & Marshall, 2000)
Motivation	"a set of energetic forces that…initiate work-related behavior…" (Pinder, 1998, p. 11; Pinder, 1984)
Motivational Force	(MF) "a multiplicative function of valence…instrumentality…and expectancy" (Nyberg et al., in press, p. 4; Porter & Lawler, 1968; Vroom, 1964); A task performance situation has multiple motivational forces associated with different effort levels; Individuals are expected to exert effort associated with the highest motivational force.
Pay Basis	"decisions regarding how to pay" (Gerhart & Rynes, 2003, p. 115)
Pay Ceiling	Pay maximum, the highest possible pay amount
Pay Floor	"the amount of pay that he or she [the employee] can be certain to take home" (Brown & Huber, 1992, p. 280); Pay minimum, the lowest possible pay amount
Pay-for-Performance	(PFP) "pay that varies with some measure of individual or organizational performance…" (Milkovich et al., 2014, p. 686)
Pay Range	"size of the difference between the highest pay rate and the lowest pay rate" (Kepes et al., 2009, p. 507); "the pay difference across employees in the same job" (Kepes et al., 2009, p. 500)
Pay Variation	"the extent to which pay varies within a collective" (Gupta et al., 2012, p. 104)
Performance	Engaging in "behaviors relevant to the goals of the organization" (Klehe & Anderson, 2007, p. 978)
Performance→ Pay Expectancy	(P→Pay) "the perceived likelihood that the desired performance will be rewarded [with pay]" (aka, instrumentality, Nyberg et al., in press, p. 4; Porter & Lawler, 1968; Vroom, 1964)
Valence of Pay Outcome	"perceived value of the reward [pay]"(Nyberg et al., in press, p. 4; Porter & Lawler, 1968; Vroom, 1964)

Hypothesis Development

Hypotheses are developed as follows. First, the relationships between pay range, allocation rules, and individual performance are proposed. A critical part of this investigation is testing the relationship between performance-based pay variation and individual performance. The review of the literature indicated that this test should involve the policies creating the pay variation rather than a pay variation measure as used in prior non-experimental, field research. Pay variation is best conceptualized from a policy perspective as pay range; allocation rules are fundamentally different despite the use of allocation rule logic to explain pay variation's relationship with performance. Following these hypotheses, expectancy theory is applied in detail to the pay variation and performance model to develop hypotheses about the mechanisms through which pay variation may affect individual motivation and performance.

Main and Interaction Effects of Pay Policies on Performance

In the review of the literature, it was noted that performance-based pay variation is primarily a function the incentive intensity (conceptualized as pay range in this investgation). Thus, an ideal test of the pay variation and individual performance assumption isolates the pay range policy. The theories outlined above (e.g., agency, expectancy) all point to positive effects of pay range, assuming performance is the source of pay differences. Specifically, wide pay ranges have greater separation between pay floors and pay ceilings. As the aspirational amount that can be earned increases, motivation to earn the reward for high performance should increase. All else equal, larger rewards are more desirable than small rewards, and so motivation is expected to be higher as pay ranges increase.

A separate issue is the effect of allocation rules on individual performance. Allocation rules, specifically equity and equality distributions, have been confounded with pay variation in

the past. While allocation rules are different from pay variation and should not be treated the same conceptually, it is worthwhile to test the relationship of allocation rules with individual performance as well. Equity allocation rules focus individuals on their own individual performance, strengthening the line of sight between the behavior and the reward. Equality allocation rules allow for free riding (i.e., exerting less effort due to group pooling of efforts, Shepperd, 1993) as the reward is less clearly related to one's individual performance. These line of sight effects make equity allocation rules likely to create a stronger situation for encouraging individual performance than equality allocation rules.

Widening pay ranges increase reward intensity. As the range increases, equity-based allocation rules should lead to stronger individual motivational effects. By contrast, equality-based allocation rules are likely to weaken individual motivation because of a weaker link between individual performance and pay (i.e., weaker line of sight, conceptualized as P→O expectancies when applying expectancy theory). This is because individual effort may be viewed as less likely to influence the performance outcomes of the group, which are the primary determinant of the pay that will be earned when equality allocation rules are used. Reward intensity should strengthen the effect of allocation rules on individual behavior. Individual performance is rewarded when equity allocation rules are in place while group performance is rewarded when equality allocation rules are in place. Thus, increasing the reward intensity should have a stronger effect on individual performance outcomes under equity allocation rules than under equality allocation rules.

The preceding logic leads to the following three hypotheses:

Hypothesis 1: Individual performance is higher in high pay range conditions than in low pay range conditions.

Hypothesis 2: Individual performance is higher in equity allocation rule conditions than in equality allocation rule conditions.

Hypothesis 3: Individual performance depends on the interaction of pay range and allocation rule such that: Individual performance will be significantly higher in high pay range conditions than in low pay range conditions under equity allocation rules, while the effect of pay range on individual performance will be weaker or non-significant across pay range conditions under equality allocation rules.

Expectancy Theory Components

Theoretical framework. Specific theoretical frameworks that explain the relationships proposed in hypotheses 1, 2, and 3 are rarely tested. Thus, I focus on applying expectancy theory as the theoretical mechanism for pay variation's effects, and testing these relationships.

Expectancy theory is chosen for several reasons. One, expectancy theory is a parsimonious and comprehensive theory of motivation. It is parsimonious because it narrows down the multitude of factors that influence motivation to three – effort to performance expectancies (from here on, E→P expectancies), performance to outcome expectancies (from here on, P→O expectancies), and outcome valences. It is comprehensive because most factors in the environment or in the individual that are likely to influence motivation can be understood based on their relationship with these three factors. In fact, expectancy theory can accommodate both tournament theory and agency theory. Tournament theory involves individual desires for the large prize (i.e., high valences) in high pay variation contexts. It also explains that employees compete through performance for this prize, meaning that performance must be believed to be the reason for gaining the prize (i.e., strong P→O expectancies). Agency theory also suggests incentives align the interests of employees and organizations because they are based on desired employee behaviors (i.e., P→O expectancies) and valued (i.e., valence).

Expectancy theory has been well-applied to pay contexts. Lawler, a well-known scholar in pay research, often applied expectancy theory to explain work motivation as it relates to pay

(e.g., Lawler, 1971, 1973). As such, in much of his work, he applied expectancy theory to explain why organizations may struggle to appropriately motivate using compensation. More recently, scholars have used the expectancy framework to explain the pay variation and firm performance relationship (e.g., Gupta et al., 2012; Kepes et al., 2009). Here, I apply the theory at the individual level. This test of the theory to pay variation responses at the individual level is rarely conducted but makes logical sense based on the theory's attributes. Recent theorizing in pay variation research has emphasized the value of expectancy theory in explaining pay variation's relationship with employee outcomes (e.g., Downes & Choi, 2014; Gupta et al., 2012), yet there has not been an empirical test of the individual-level theoretical mechanisms of the theory as applied to pay variation. In this study, I test these effects directly.

Formulation. Here, important expectancy theory issues relevant to the development of a pay variation and individual responses model are noted. The three expectancy theory components are E→P expectancies, P→O expectancies, and valences (see the literature review and Table 3 for definitions). These three components combine to predict motivational force. The equation is: Motivation Force (MF) = E→P * $\sum$ (P→O * V). Prior research on pay has often assumed E→P expectancies are constant (Gupta et al., 2012). In reality, E→P expectancies are likely to vary based on differences in situations and people. Objectively, some situations lead to higher E→P expectancies than other situations. For example, a sales person assigned to a high sales volume territory is more likely to perform given a certain level of effort than a sales person assigned to a low sales volume territory. Furthermore, people vary, such that some people are likely to perceive their effort as more likely to lead to performance while others do not, given the same situation. Much of the research focused specifically on expectancy theory suggests E→P expectancies have significant predictive power for motivation and performance.

For example, Van Eerde and Thierry (1996) reported an average *r* of 0.22 between E→P expectancies and performance across 21 between-subject studies in a meta-analysis of expectancy theory. The average *r* was even higher for intention to exert effort (*r*=0.38 for three studies). It seems clear the E→P expectancies are important to the prediction of performance. Thus, I include E→P expectancies to develop a more complete model of individual motivation and performance.

The second part of the equation, $\sum$ (P→O * V), states that all (P→O * V) terms are to be summed. This is because there are multiple outcomes of a behavior that may be considered, pay is only one of the many outcomes. Individuals can cognitively manage a limited number of outcomes (Lawler, 1973). In addition, an experimental design is used in this study such that the only outcome that should vary across conditions is pay. Thus, the theorizing is focused on pay outcomes, dropping the sum sign of the expectancy equation. The revised equation is: MF = E→P * P→Pay * V_{Pay}.

Expectancy theory is inherently a choice theory. It suggests that individuals consider multiple motivational forces at once associated with various behaviors or effort levels, and select the behavior and effort level associated with the highest motivational force. Because multiple choices are under consideration, some scholars view expectancy theory as a theory that should be tested within-subjects (Kennedy, Fossum, & White, 1983). It can predict across subjects as well, however. Individuals may respond to certain conditions with high E→P expectancies, P→Pay expectancies, or valences while other conditions may lower these values. We can predict that motivation will be higher between subjects across conditions that have differential effects on the high effort motivation force components.

The choice nature of expectancy theory is acknowledged here by recognizing multiple equations may be considered by individuals, and focusing on the most important of these equations to explaining motivation. Two of the main motivational force equations are the high effort and the low effort equations. These two equations represent the motivation to perform and the motivation to slack. The high effort equation is essentially the best case scenario from a motivation perspective while the low effort equation is essentially the worst case scenario.

The high effort equation involves beliefs that exerting high effort will lead to high performance, beliefs that this performance will lead to the high pay, and the valence of high pay. Relating the high pay outcome to the pay range, it is represented by the pay ceiling. That is, the highest amount possible for performing the task well is the pay ceiling. Thus, the valence of the pay ceiling is the outcome valence of interest in the high effort motivational force equation.

The low effort equation involves beliefs that exerting low effort will lead to low performance, beliefs that this low performance will lead to low pay, and the valence of low pay. Relating low pay to the pay range, this is represented by the pay floor. That is, the lowest amount that will be paid for performing the task poorly is the pay floor. Thus, the valence of the pay floor is the outcome valence of interest in the low effort motivational force equation.

While both equations may be relevant, the high effort equation is especially important to explaining motivation to perform well. As the MF_{HE} (i.e., the motivation force to exert high effort) increases, higher motivation to perform is expected since performing well is perceived as likely, being rewarded for performing well is perceived as likely, and the rewards for performing well (i.e., the pay ceiling) are valued. Kepes et al. (2009) reported that the pay ceiling, rather than the pay range or pay floor drove performance effects of pay variation in a sample of truck drivers. Thus, in the theorizing and test presented here, the primary equation applied is (where

HE=high effort): $MF_{HE} = E \rightarrow P * P \rightarrow Pay * V_{Pay}$. As needed, the MF_{LE} (i.e., the motivational force to exert low effort) is discussed for comparison purposes.

In sum, the following model has important characteristics that distinguish it from other applications of expectancy theory in the pay variation context. E→P expectancies are treated as relevant to the pay context. Pay is assumed to be the primary outcome under consideration. Valences for different pay levels are included. Finally, as the motivational force to exert high effort increases, motivation is expected to increase.

Effort to Performance Expectancies. As noted, E→P expectancies are perceptions that one's effort will lead to certain performance outcomes. Referring back to the two MFs, the E→P expectancy for MF_{HE} is more likely to vary among individuals than the E→P expectancy for the MF_{LE} equation. That is, we can assume that beliefs that low effort leads to low individual performance will be high. Doing little to nothing almost certainly results in low performance. The more variable E→P expectancy is the one associated with high effort. While some individuals may exert high effort and still perform poorly, others may exert high effort with better results. An example may clarify the distinction made here. An individual may consider the effort level to exert in a marathon race. The MF_{HE} is the force associated with working toward a fast running time; the MF_{LE} is associated with running a slow time. In these equations, the E→P expectancy for running slowly (i.e., the belief that exerting low effort leads to a slow individual running time) is likely to be high for most individuals; the E→P expectancy for a fast running time (i.e., the belief that exerting high effort leads to fast individual running time) is likely to vary greatly across individuals.

Most pay variation research does not incorporate E→P expectancies. This is likely because pay itself is more proximal to the other two expectancy factors (P→Pay expectancy,

valence). There are important interactions among the expectancy components, however, such that E→P expectancies are relevant to overall motivation in conjunction with the other expectancy components that are influenced by pay. Thus, a proximal factor likely to explain E→P expectancies associated with exerting high effort (the MF_{HE}) is identified and incorporated into the model. The term E→P expectancy going forward refers to the E→P expectancy for the MF_{HE} equation, unless otherwise specified.

Campbell (1990) defined ability (i.e., what one is capable of) as including declarative knowledge and procedural knowledge and skill. Declarative knowledge is one's ability to "state the relevant facts and things," and procedural knowledge and skill is "the knowledge attained when knowing what to do (i.e., declarative knowledge) has been successfully combined with knowing how to do it" (Klehe & Anderson, 2007, p. 978). For any given performance task, then, ability can be viewed as knowing what to do and how to do the given task. Individuals who have high ability are likely to perceive themselves as capable of completing a task when effort is exerted since they are likely to have objectively higher E→P probabilities (Lawler, 1973). Thus, ability should be positively related to E→P expectancies.

Performance to Outcome Expectancies. Performance to outcome expectancies are perceptions that one's performance will lead to certain outcomes (Porter & Lawler, 1968; Vroom, 1964). P→O expectancies in this study are reduced to include only one outcome, such that only P→Pay expectancies are considered. The P→Pay expectancy for MF_{HE} involves the belief that high performance will lead to the high pay outcome.

P→Pay expectancies are likely to vary as a result of the pay system. For this reason, pay research invoking expectancy theory often focuses on this link in the expectancy theory equation (e.g., Kepes et al., 2009). In the marathon runner example, it is possible to see how prize

structure (similar to attributes of a pay system) may influence P→O expectancies. If the marathon is a contest where many prizes are given, the runner is likely to have higher P→O expectancies for the high effort equation than if only one prize is given.

The allocation rule in this study appears most likely to influence P→Pay expectancies for exerting high effort (i.e., for MF_{HE}). Specifically, allocation rules that emphasize rewards for individual performance (i.e., equity allocation rules) should be associated with higher P→Pay expectancies for the MF_{HE} than those that emphasize rewards for group performance (i.e., equality allocation rules). Equity allocation rules indicate that the higher performing individuals receive pay in line with their contributions; equality allocations imply that individual performance differences are ignored in pay allocations within a group (Leventhal, 1976). Pay in the equality case, then, is a reflection of group performance alone, over which individuals have less control, weakening P→Pay expectancies associated with the MF_{HE} (Schwab, 1973). True, individuals contribute to group performance. The contributions of others are uncertain, especially the extent to which they will perform well. Thus, one's own performance has a weaker relationship with pay outcomes for MF_{HE} when equality determines allocation amounts.

Equity allocation rules should lead to a stronger line of sight between individual performance and outcomes since the individual's contributions determine individual pay outcomes (Lawler, 1973). A group that is working toward a pool of pay to be distributed may perform individually at varied levels. The amount of the pool earned by the group is then distributed to group members based on each member's contribution. Assuming a non-zero reward pool, an equity rule may lead to a large payout for the individual even when the group performs poorly because the small pool is distributed according to contribution. A small pool may result in high pay for an individual if she is performing highly and a large pool may still

result in low pay for an individual if he/she is performing poorly. Overall, then, the individual's performance is the primary determinant of her reward when equity allocation rules are in place.

Supporting the superiority of equity allocation rules for individual performance purposes, Karau and Williams (1993) provided meta-analytic evidence for social loafing in collective contexts. Based on an integrative model drawing on expectancy theory, the Collective Effort Model (CEM), the authors reasoned that the relationship between individual performance and group performance was important to effort exertion. As this link weakens, beliefs that individual performance will lead to valued outcomes decrease (lower P→O*V values). Corroborating this idea, Schwab (1973) found that individual pay plans were associated with higher P→O expectancies than group incentive plans in a study of production workers.

More recent evidence regarding equity and equality allocations for motivation also supports the idea that MF_{HE}, and thus overall task motivation, should increase for equity compared to equality. For example, social loafing (a sign of low motivation) was lower in groups when an individual incentive component was included, rather than an entirely group-based reward system (Pearsall, Christian, & Ellis, 2010). In another study, Barnes, Hollenbeck, Jundt, DeRue, and Harmon (2011) reported that group incentives that included an individual component led to faster, i.e., higher quantity, performance outcomes (a sign of high motivation) than group incentives without individual differentiation.

Valence. Valence refers to feelings about an outcome. The outcome of interest in the MF_{HE} equation is the pay ceiling. Though some have proposed that pay is low in importance to employees (e.g. Herzberg, Mausner, Petersen, & Capwell, 1957), it is likely that low reporting on pay importance is an issue of socially desirable responding rather than actually feelings about pay (Rynes, Gerhart, & Minette, 2004). Several studies show that pay is an important motivating

influence (Guzzo, Jette, & Katzell, 1985; Locke, Feren, McCaleb, Shaw, & Denny, 1980). Evidence, then, generally suggests that pay is an outcome of positive valence for most individuals.

Similar to P→Pay expectancies, the value assigned to the pay outcome may be affected by the pay system in place. The marathon runner may put much higher valence on a one million dollar reward for a fast running time than a one hundred dollar reward. Similarly, the ceiling of the range of pay outcomes for performance on a task will affect the valences assigned to a high effort MF equation. For an employee making a decision about whether or not additional effort is worthwhile, pay range information, and specifically the pay ceiling, indicates how much pay is possible if performance is high.

In general, money has an increasing value as the amount increases. Of course, this is a foundational assumption of much of the economics literature. The function may be linear or non-linear depending on the theory, but it is generally increasing at low and moderate levels of pay (Hey & Orme, 1994). Behavioral choices are often predicted based on payout maximization. Based on rational choice theory, it is assumed that given two alternatives, individuals will select the alternative with the greatest utility, which can be calculated by assigning monetary values to potential outcomes (Mellers, Schwartz, & Cooke, 1998). In fact, economists are known for their ability to assign monetary valuations to non-monetary concerns (e.g., health care, sustainability, Hanley, Ryan, & Wright, 2003).

Pay is money received in exchange for work. Pay has all the value characteristics associated with money, but also has symbolic value (Furnham & Argyle, 1998; Mitchell & Mickel, 1999). In fact, a recent article indicated that the importance of money earned as pay for effort is more affected by increasing amounts than the importance of money from random

sources (Devoe et al., 2013). Thus, from both an instrumental perspective and a symbolic perspective, higher ceilings should have higher valences than lower ceilings.

Expectancy Theory Hypotheses. These basic hypotheses are valuable as support will demonstrate that allocation rule and pay ceilings do indeed influence the components of the expectancy equation. The preceding logic leads to the following hypotheses:

Hypothesis 4: Individual E→P expectancy is positively related to individual ability.

Hypothesis 5: Individual P→Pay expectancy is higher in equity allocation rule conditions than in equality allocation rule conditions.

Hypothesis 6: Pay valence is higher in high pay ceiling conditions than in low pay ceiling conditions.

Individual Motivation

Applications of the expectancy components to individual motivation and performance have been conceptualized in two ways. One, the expectancy components can be viewed as predictors of overall motivation (Van Eerde & Theirry, 1996) which then predicts performance outcomes. Two, the expectancy components can be combined as in the MF function (MF_{HE} = E→P * P→Pay * V_{Pay}) to create the motivational force for performance. The MF value is then tested as an antecedent to performance.

The first approach allows for the separation of expectancy components from motivation, and adds a variable between the expectancy components and performance (expectancy components → motivation → performance). The second approach is somewhat truer to the original conceptualization of expectancy theory (Kennedy et al., 1983) and requires attention to the specific MF of interest. With this approach, there is no mediator (E→P * P→Pay * Valence of Pay Outcome = Motivational Force → Performance). Predictions are made according to the first approach for motivation here. These predictions allow for consideration of the nature of the

expectancy component's interaction. For purposes of testing the motivation to performance relationship (addressed in the next section), both the motivation → performance view and the MF → performance views are applied.

To the extent the MF_{HE} is high, individuals should be highly motivated. There is evidence that each factor associated with the high effort equation has an effect individually in addition to potential interactions. Specifically, in a meta-analysis of expectancy theory components, Van Eerde and Thierry (1996) reported that all three components positively predicted effort and intention.

Considering the marathon runner example illuminates this point. If she believes she can run fast, believes that running fast will lead to a prize, and values that prize, she is likely to exert the effort to run faster. Assuming none of the factors is equal to zero, there should be a basic direct effect of every component on motivation. Each of the factors associated with exerting high levels of effort is expected to increase motivation.

The multiplicative nature of the theory has been debated by scholars because evidence of the interactions is weak (Lawler, 1994). In fact, Van Eerde and Theirry stated, "Vroom's models do not yield higher effect sizes than the components of the models. This suggests that the models lack validity" (1996, p. 581) as a conclusion in their meta-analysis on expectancy theory. Since expectancy theory is formulated to be multiplicative (Arnold, 1981; Nagengast et al., 2011; Porter & Lawler, 1968; Vroom, 1964), the interactions of the components on motivation are predicted here. Thus, there is not agreement among scholars regarding the interaction of the expectancy components. A test of this interaction in the context of pay variation is lacking. It is valuable to test these interactions, thereby contributing to application of expectancy theory to pay variation research and to the debate on the multiplicative nature of expectancy theory.

Predicting the nature of the interaction effects is possible by applying the equation outlined earlier and mathematically testing the effect of changes in the components on motivation force. The revised equation provided earlier removed the summation of outcomes and focused on the pay outcome only: $MF_{HE} = E \rightarrow P * P \rightarrow Pay * V_{Pay}$. Because values for E→P expectancies and P→Pay expectancies are probabilities, they are represented in this illustration within a range of 0 to 1; valences can be positive or negative. Here, positive valences of pay are assumed based on the logic that money is valued. To ensure a standard scale, valences for pay outcomes are also treated with values between 0 and 1 in this illustration.

The equations are estimated in Table 4. A wide range of values could have been considered. The values presented here are simply for illustrative purposes. For two-way interaction predictions, the third factor is assumed to be held constant. Constants are assigned a value of 0.50; high probabilities and valences are assigned a value of 0.90; low probabilities and valences are assigned a value of 0.10. Assigning values allows for prediction of the nature of the interaction effect, which is plotted in Figure 2. Two-way interactions are similar across factors.

It should be noted that two-way interactions are primarily included for the sake of completeness. The unmodified expectancy theory formulation is Motivation Force (MF) = E→P * ∑ (P→O * Valence of Outcome). Thus, the only two-way interaction that is true to the original formulation of expectancy theory is the P→Pay expectancy by pay valence interaction. The three-way interaction is best for incorporating E→P expectancy. However, to test the three-way interaction, all two-way interactions must be included. Thus, all two-way interactions are hypothesized.

Table 4

Illustration of Expectancy Two-way Interaction Equations

Valence Constant	Low E→P	High E→P
Low P→Pay	MF = 0.10 * 0.10 * 0.50 = 0.005	MF = 0.90 * 0.10 * 0.50 = 0.045
High P→Pay	MF = 0.10 * 0.90 * 0.50 = 0.045	MF = 0.90 * 0.90 * 0.50 = 0.405

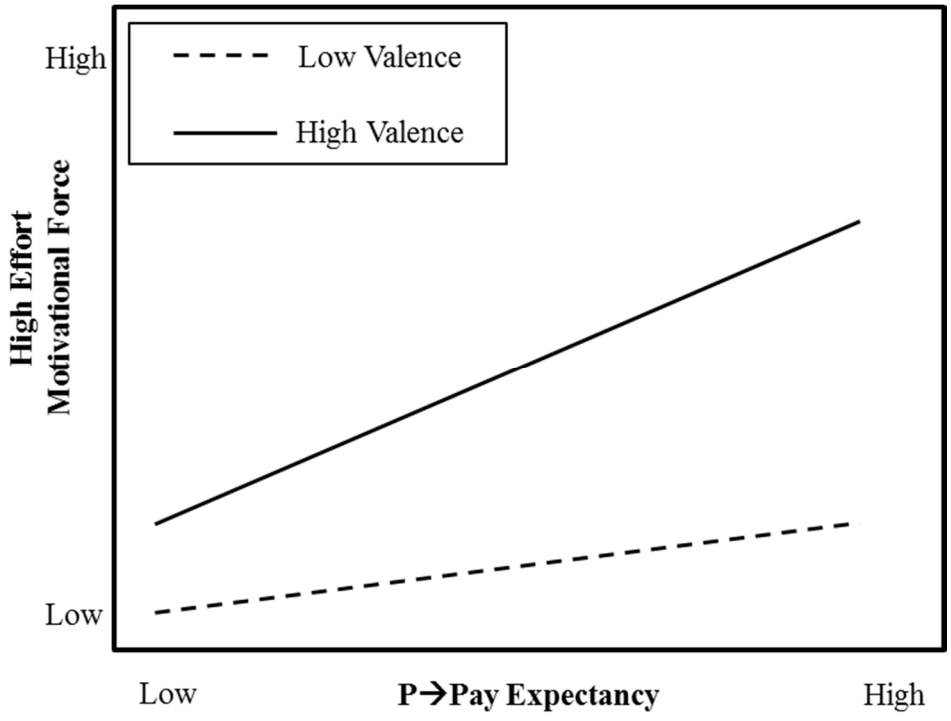
P→Pay Constant	Low E→P	High E→P
Low Valence	MF = 0.10 * 0.50 * 0.10 = 0.005	MF = 0.90 * 0.50 * 0.10 = 0.045
High Valence	MF = 0.10 * 0.50 * 0.90 = 0.045	MF = 0.90 * 0.50 * 0.90 = 0.405

E→P Constant	Low P→Pay	High P→Pay
Low Valence	MF = 0.50 * 0.10 * 0.10 = 0.005	MF = 0.50 * 0.90 * 0.10 = 0.045
High Valence	MF = 0.50 * 0.10 * 0.90 = 0.045	MF = 0.50 * 0.90 * 0.90 = 0.405

Note. The basic expectancy equation is: MF_{HE} = E→P * P→Pay * Valence of Pay Outcome

Figure 2

Nature of Expectancy Two-way Interactions



A simple way to demonstrate the potential for a three-way interaction is to look at the motivation force equation. Effects of zero would make this illustration especially strong because all but the high E→P expectancy, high P→Pay expectancy, and high pay valence environment would lead to zero motivation force; however, zero values seem unlikely in a work context. That is, because someone is in a job that he is qualified for, he is unlikely to have a zero value for E→P. Similarly, assuming that pay is performance-based, even when equality allocations are used, there should be some probability for performance to lead to pay. Finally, pay is assumed to have a positive value, especially the pay ceiling (i.e., the pay valence incorporated into the high effort MF equation). All values are represented as non-zero.

The theory and formula lead to the prediction that when all expectancy components are high, motivational force will be much higher than if any one factor is low. As with the two-way interactions, these values across possible scenarios are included in a table (Table 5). The nature of the predicted interaction is presented in Figure 3.

Table 5

Illustration of Expectancy Three-way Interaction Equations

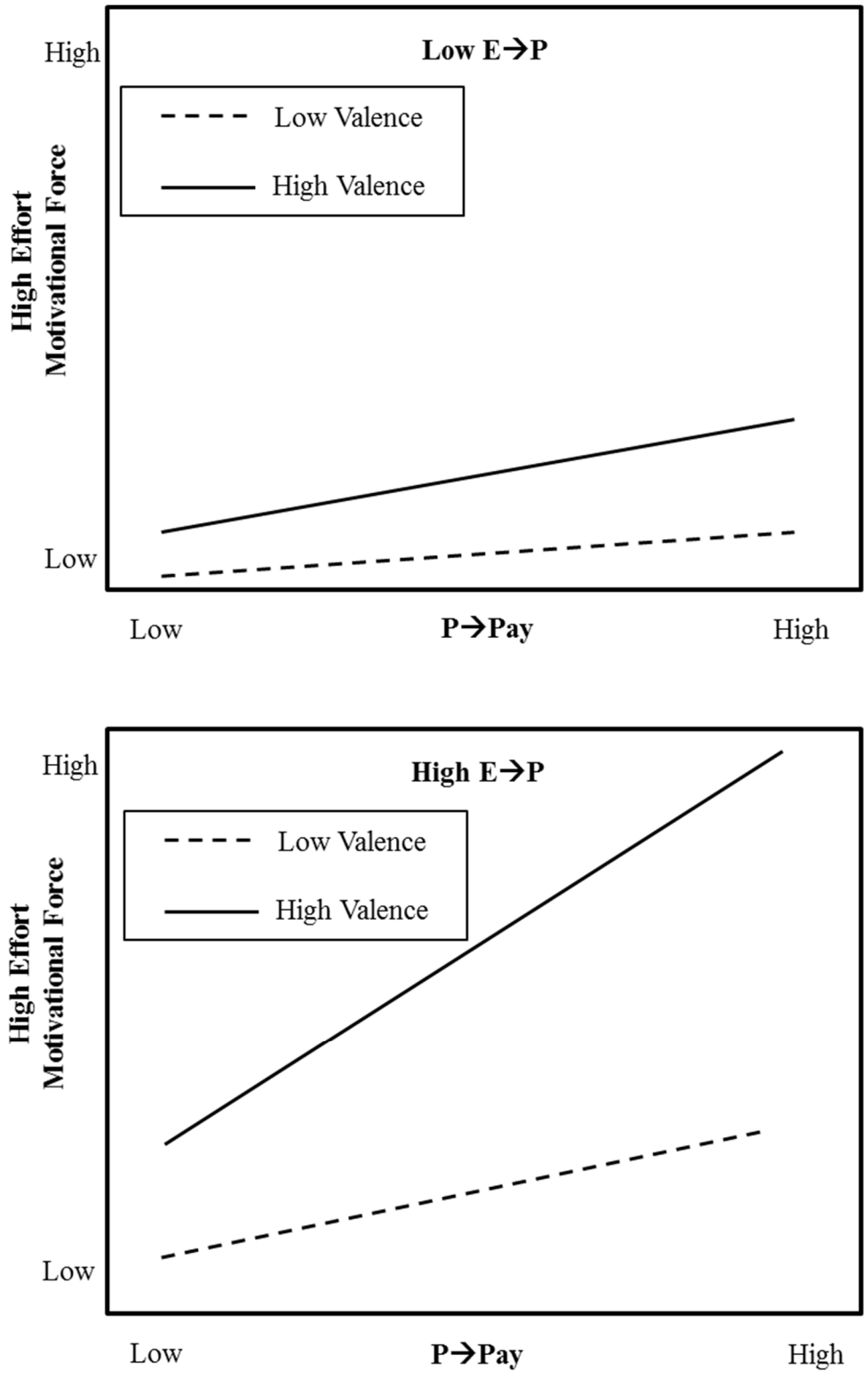
Low E→P	Low P→Pay	High P→Pay
Low Valence	MF = 0.10 * 0.10 * 0.10 = 0.001	MF = 0.10 * 0.90 * 0.10 = 0.009
High Valence	MF = 0.10 * 0.10 * 0.90 = 0.009	MF = 0.10 * 0.90 * 0.90 = 0.081

High E→P	Low P→Pay	High P→Pay
Low Valence	MF = 0.90 * 0.10 * 0.10 = 0.009	MF = 0.90 * 0.90 * 0.10 = 0.081
High Valence	MF = 0.90 * 0.10 * 0.90 = 0.081	MF = 0.90 * 0.90 * 0.90 = 0.729

Note. The basic expectancy equation is: MF_{HE} = E→P * P→Pay * Valence of Pay Outcome.

Figure 3

Nature of Expectancy Three-way Interaction



Individual Motivation Hypotheses. The preceding logic leads to the following hypotheses:

Hypothesis 7: Individual E→P expectancy is positively related to individual motivation.

Hypothesis 8: Individual P→Pay expectancy is positively related to individual motivation.

Hypothesis 9: Pay valence is positively related to individual motivation.

Hypothesis 10: The MF_{HE} components (individual E→P expectancy, individual P→ Pay expectancy, and pay valence) interact to predict individual motivation, such that:

Hypothesis 10a: Individual E→P expectancy interacts with individual P→Pay expectancy to predict individual motivation; the positive relationship between E→P expectancy and motivation is strengthened as P→ Pay expectancy increases.

Hypothesis 10b: Individual P→Pay expectancy interacts with pay valence to predict individual motivation; the positive relationship between P→Pay expectancy and motivation is strengthened as the pay valence increases.

Hypothesis 10c: Individual E→P expectancy interacts with pay valence to predict individual motivation; the positive relationship between E→P expectancy and motivation is strengthened as the pay valence increases.

Hypothesis 10d: There is a three-way interaction among the three MF_{HE} components, such that motivation is highest when all three components are high and low when any one component is low. (see Figure 3 for the nature of this interaction)

Individual Performance

The foundational concern of the pay variation literature is not simply that motivation increases but that performance increases (Shaw, 2014). All else equal, intentions (i.e. motivation) lead to behaviors (Ajzen, 1991). Research indicates a strong correlation between motivated effort and performance (Broedling, 1975; Lawler & Porter, 1967).

The motivation and performance relationship has been discussed at length in prior research (Broedling, 1975; Lawler & Porter, 1967; Vroom, 1964), but has been questioned by

some recent pay researchers (Ariely, 2008; Ariely, Gneezy, Loewenstein, & Mazar, 2009; Pink, 2009). Some of this work has suggested that over-motivation created by incentives leads to performance anxiety and prevents positive performance outcomes (Ariely et al., 2009). However, a closer look at work in this area suggests that it is extreme rewards that may explain this effect (e.g., $300 for a small amount of work). Thus, it is valuable to test this relationship in a pay context where amounts vary by less extreme amounts.

Since the pay ranges tested in this study are more reasonable than those of the prior research on this issue (Ariely et al., 2009), such that the over-motivation problem is unlikely, the positive motivation to performance relationship is expected to hold. Specifically, greater motivation will increase performance.

Returning to the prior discussion of expectancy theory, two tests are possible to explain motivation and performance. In one, the motivation to perform the task predicts task performance. This is based on the Expectancy Components→Motivation→Performance model. This approach allows for the testing of hypotheses 7 through 10 with a subsequent test of the motivation and performance relationship. In the second test, the high effort motivation force is actually calculated (MF_{HE} = E→P * P→O * V_{Pay}); this MF value is then used to predict performance. Thus, hypotheses are presented to address both approaches to testing. The full model is presented in Figure 4.

Hypothesis 11: Individual motivation is positively related to individual performance.

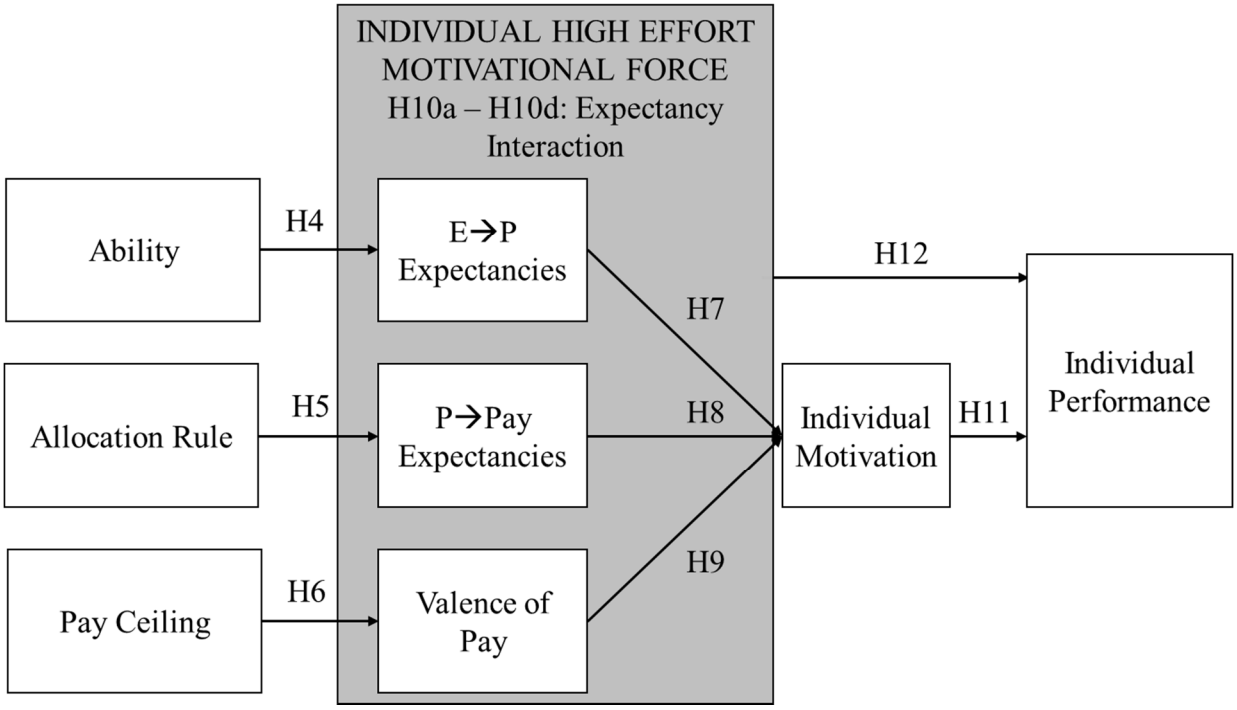
*Hypothesis 12: Individual motivational force (MF=E→P * P→Pay * V_{Pay}) is positively related to individual performance.*

The model presented in Figure 4 depicts a complex network of relationships that explain the effects of horizontal pay variation-related policies on individual performance. Each link has been hypothesized above (hypotheses 4 through 12). Support for the hypothesized links will

contribute to our understanding of individual performance as an outcome of pay variation-related policies and individual ability. The mediated relationships presented in Figure 4 are also tested.

Figure 4

Full Model



Summary

The hypotheses and model presented here contribute to the conversation on pay variation in a number of ways. First, allocation rules (i.e., equity and equality) are separated from pay range (i.e., incentive intensity). This distinction leads to separate predictions. In fact, these pay policies are expected to interact to predict performance outcomes. Furthermore, allocations rules are predicted to influence P→Pay expectancies while pay range, and specifically pay ceiling, is predicted to affect valences. Ceilings are theorized as influencing the high effort equation,

which influences subsequent performance. Kepes et al. (2009) reported that the ceiling was the driver of pay range effects.

Second, the hypotheses presented are in regard to *individual-level* responses to pay variation-related policies. While often theorized, individual-level responses have been somewhat neglected by the management discipline in pay variation research. A test of the effects of policies on individual level responses can test the assumption that individuals respond differentially to pay variations. In addition, explicit incorporation of the expectancy theory components tests the validity of expectancy theory as an explanatory motivational framework for pay variation-related policies. Recent theoretical work has indicated that expectancy theory may be ideal for explaining the effects of pay variation (e.g., Downes & Choi, 2014; Gupta et al., 2012), but an empirical test is lacking.

Third, the hypotheses here also address other ongoing debates of the pay literature. The effects of over-motivation in pay contexts have received much attention of late (Ariely, 2008; Ariely et al., 2009). In this study, the motivation and performance relationship is hypothesized to be positive (hypotheses 11 and 12). If it is found to be positive, this will provide evidence that within realistic pay settings, where values are not extreme, pay-for-performance does not negatively affect performance due to over-motivation. Another inconclusive area relates to whether or not the multiplicative function of expectancy theory is valid (Van Eerde & Theirry, 1996). Expectancy interactions were hypothesized. Supported for these hypotheses would provide evidence for the interactive effects proposed by expectancy theory.

In sum, the hypotheses provided here test old assumptions and provide a new treatment of pay variation. The old assumptions refer to pay variation as an influence on individual motivational and performance responses. The new conceptualization is a more nuanced policy

view of pay variation. By separating allocation rules from pay range, the model is based on a more precise and comprehensive approach to pay variation from an individual motivation and performance perspective.

CHAPTER 3

METHODOLOGY

Overview

A primary purpose of this study is to address *causal* inferences regarding pay variation and individual performance. An experiment was chosen as the research design because experiments are the most appropriate design for internal validity purposes (Shadish et al., 2002). The two primary independent variables for this study are pay range and allocation rule.

As noted earlier, pay range is a combination of pay ceilings and pay floors. If both pay ceilings and pay floors differ across manipulations, it is not possible to know precisely whether the ceiling or the floor is related to the dependent variable in a causal way. Thus, pay range was separated into a pay ceiling manipulation and a pay floor manipulation. This means that three independent variables were identified for manipulation: allocation rule, pay ceiling, and pay floor. The combinations that result from the pay ceiling and pay floor manipulations represent various pay ranges. For testing purposes, described in Chapter 4, each manipulation was entered as an independent variable.

Allocation rule included two levels (i.e., equality and equity); pay ceiling included two levels (i.e., high of $12 and low of $8); pay floor included two levels (i.e., high of $6 and low of $2). This led to a 2x2x2 fully crossed factorial matrix, i.e., 8 cells or conditions, as depicted in Table 6. Participants received pay within this range for performing a data entry task (addressed in more detail below).

Table 6

Experimental Conditions

Pay Floor/ Bottom End of Range	Pay Ceiling/Top End of Range			
	Low $8.00		High $12.00	
	Equality	Equity	Equality	Equity
Low $2.00	$2.00 - $8.00 Allocation based on group membership	$2.00 - $8.00 Allocation based on individual contribution	$2.00 - $12.00 Allocation based on group membership	$2.00 - $12.00 Allocation based on individual contribution
High $6.00	$6.00 - $8.00 Allocation based on group membership	$6.00 - $8.00 Allocation based on individual contribution	$6.00 - $12.00 Allocation based on group membership	$6.00 - $12.00 Allocation based on individual contribution

In this chapter, the study methodology is described. This includes information about the task performed by participants, experimental procedures, manipulations, and measures. In addition, pretesting and pilot testing results are discussed.

Subjects

Participants in the study were business students at a southern university. All students participating in the study received extra credit in a business course for their participation. Students were informed that they could earn extra credit for participating in a financial services task study in the business behavioral research lab. In addition, they were told there was the potential to earn money; however, no expected monetary amounts were communicated to participants.

Because there were human subjects involved in this research, institutional review board approval was necessary. Following initial protocol approval, modifications to the study design were made. These modifications were mainly the addition of questionnaire items. Each

modification has a separate approval letter. The institutional review board approval letters are included in Appendix A.

Task and Materials

The task for the study was a computer task involving data entry of financial information. This task was completed multiple times. The first time was a two minute training session free of any manipulation. The second and third times were each five minutes. The second and third sessions occurred following the manipulation, and were completed for pay. Completing the task required participants to match an applicant ID number on a paper form to an applicant ID number on an electronic form, then enter the income value from the paper form into the electronic form.

The task required printed materials for each participant. These materials were included in colored binders at each participant's work station. The materials were identical for all participants, and there were separate sets of material for each of the three sessions. The participants were asked to use information from the printed material to enter data on the computer (see Figure 6 for an example of the paper forms used by participants).

Figure 6

Mortgage Application Example

MORTGAGE APPLICATION	
APPLICANT INFORMATION – APPLICANT # 6305	
Name: Ginger Bohm	
City: Cleveland	
State: Ohio (OH)	ZIP Code: 44101
LOANS, DEBTS, OR OBLIGATIONS	
Monthly Payments: $1260.69	
Total Liabilities: $49722	
INCOME AND ASSETS	
Income: $48856	
Cash: $6030	
Investments: $33558	
Property: $108113	
MORTGAGE INFORMATION	
Loan Request: $222588	
Down Payment: $37573	

Participants were told their task was a group task with other members in different locations also working on the task with them. This group nature of the task was required because the allocation rule involves distribution within a group context. In reality, the groups were simulated in that actual groups did not exist, with the task set up to create the illusion of a group.

The study required some level of interdependence to ensure the task could feasibly involve equality or equity allocation rules. That is, if there is no interdependence, such that group performance was simply additive, an equality allocation rule would not make sense; if there is full interdependence, such that individual contributions could not be identified, an equity allocation rule would not make sense (DeMatteo, Eby, & Sundstrom, 1998). To ensure either

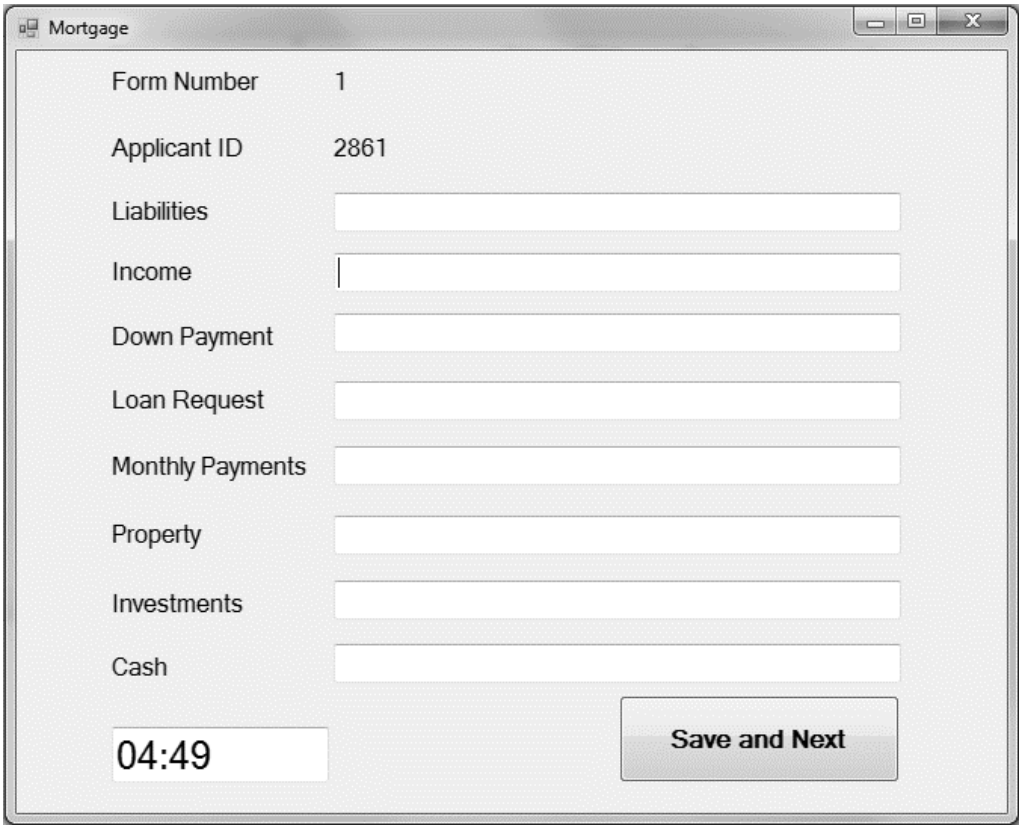
pay approach was reasonable, the task was developed to reflect some level of interdependence while retaining the ability to measure individual performance. The task program created the feeling of a group by providing information on other participants during both the training video (e.g., participants are at other universities) and during the login process (e.g., "all participants are logged in" text box). Participants were asked to enter one piece of information related to mortgage applications while other group members would input other information (see Figure 7 for the data entry form). This provided interdependence in that group members had separate pieces of important information, and they were building an overall database as a group. Furthermore, they were told that for the mortgage application to be processed, it was necessary to have six pieces of information entered correctly. There was some reward interdependence in all conditions because group performance was indicated to the participant as determining the pool of pay for the group though the allocation rules differed across conditions.

The task was developed to reflect work of an entry level financial services employee. Participants were told that the study would help researchers better understand the most effective work design for this specific task.

An additional requirement for the task was that it allow for individual performance measurement that could be completed quickly and efficiently. Thus, the program quickly referenced the database entries completed by the participant to check for the number of accurate entries completed during the data entry session. The data on performance was communicated to a laptop in the debriefing room to allow for payment at the end of the study.

Figure 7

Mortgage Application Task Data Entry Form



Experimental Procedure

Participants recruited through courses signed up to participate in the study through an online experiment management system. Using the online system, participants could browse the available times and selected a 1.5 hour timeslot to participate. Times were available during the day and in the evening so that most individuals who wanted to participate could participate. There were 47 sessions available for sign up with 18 timeslots per time period. This provided 846 available spots.

The full participant schedule is presented in Table 7. On the day of the session, participants went to the business behavioral research laboratory at their assigned time. Once at the lab, participants checked in at the front desk. Participants completed an informed consent

form (see Appendix A for a copy of the informed consent form), then listed their instructor information on a separate sign-in form so that extra credit could be assigned.

At the time the study was to start, participants were told their participant ID number and given a notecard with both their participant ID number and laptop number written on the card. They were told that the participant ID number should be entered correctly every time to ensure payment at the end of the study and asked to write the ID number by their name on the sign in sheet. This was done because the ID number was critical for the program to run correctly. The computer program referenced the participant ID number to indicate the appropriate information to display because the participant ID number contained the condition number. The participant was then instructed to go to the computer lab, find his/her assigned laptop, and enter the participant ID number on the laptop to begin the study.

During the study (i.e., after sign in and before the payment and debriefing), there was no need for interaction with the experimenter except in the case of questions. At the end of the session, participants were paid and debriefed by the experimenter. Because everything went through the computer program, participants had as much time as needed to complete questionnaires or read information. The only time-constrained activities were the training and task performance sessions. This allowed for a staggered exit of participants, which was beneficial during the payment and debriefing process.

Table 7

Participant Schedule

Task	Approximate Time (Minutes)
Participant Sign-In and Consent Form Completion	5
Brief Study Introduction Video, followed by Questionnaire I: Motivational Traits, Big Five, Trait Affect, Social Desirability, Equity Sensitivity, General Mental Ability	12
More Detailed Introduction & Training Video	7
Training Practice	2
Manipulation	2
Questionnaire II: Expectancy Components, Effort and Motivation, Manipulation Checks	5
Task Performance 1	5
Questionnaire III: Individual performance, Group performance	2
Task Performance 1 Pay Information	5
Questionnaire IV: Pay Satisfaction, Fairness Perceptions, Emotions	10
Manipulation Repeated	2
Questionnaire IV (continued): Expectancy Components, Effort and Motivation, Manipulation Checks	5
Task Performance 2	5
Questionnaire V: Individual performance, Group performance	2
Task Performance 2 Pay Information	5
Questionnaire VI: Pay Satisfaction, Fairness Perceptions, Emotion, Feelings toward Group, Interest in Continuing Work	10
Pay, Debrief, Opportunity to Ask Questions	5

Once seated at their laptops, participants entered their participant ID number, then watched a short video introducing them to the study. The video included a professionally dressed man, speaking to the participant. He said the following:

> "Hello, my name is William. We really appreciate you being a part of our study today. First, let me tell you about what we are doing.
> This study is intended to help us understand the efficiency of data entry methods in the financial services industry. Your participation in this study is very important because the research findings may help banking organizations run more effectively.
>
> Over the next couple of hours, you will work with a group to complete a financial services task and respond to questionnaires multiple times. The directions for what you are to do throughout the study will be included on your laptop.
>
> Please read and follow all of the instructions provided throughout the study. Please complete all questions to the best of your ability. If you have any technical difficulties throughout the study, please simply raise your hand. You can now begin by completing the first questionnaire. "

Participants then completed a questionnaire that included several individual difference measures. Following the questionnaire, participants watched a video on the laptop that provided training on the experimental task. This training was a video made via screen capture and voice over (see Appendix B for a copy of the slides and training language). Following the video, participants were asked to use the training binder that included print mortgage application forms to practice what they had learned from the training video. Performance in this practice session was measured, but not communicated to participants. This performance measure was used as the measure of ability.

Following the training practice session, the laptop screen provided additional information about participating in the task as a member of a group and the method of payment for the participant (i.e., the manipulation). The participant completed Questionnaire II after the manipulation. Questionnaire II included motivation measures and manipulation checks. The participant then began their first task performance session using a binder of printed materials

labeled TASK1. This task performance session took place for five minutes. At the end of the five minutes, participants responded to Questionnaire III regarding perceived individual and group performance. At this point, the data collected were sufficient for testing all hypotheses proposed in Chapter 2. However, in order to allow for a broader data collection that incorporated important considerations in this area of research, such as affective and cognitive responses to compensation after a payment is made, additional questionnaires were administered and the manipulation was repeated. The next paragraph describes this extension. However, all hypotheses were tested based on data from Questionnaire II, Questionnaire III, the training performance session, and the TASKI performance session.

Following Questionnaire III, a message told the participants: a) their own performance level (measured based on the number of accurate entries and performance cutoffs established during pilot testing, discussed in detail later in this chapter), b) the group's performance level (average in all cases), and c) payment based on this information and the condition. The participant then completed Questionnaire IV, which included responses to compensation after being paid (e.g., emotions and pay satisfaction). After the first part of Questionnaire IV, participants were told that they would be performing the task again for five minutes with the same pay system in place (i.e., the manipulation was repeated). This was the same pay manipulation used for the first five minute task performance session. The participants completed the second part of Questionnaire IV next, which included motivation measures and manipulation checks for the second paid round of the task. Questionnaire V was included following the task performance session to measure perceived performance before actual performance information was shared. Questionnaire VI measured responses to the pay and task. After finishing this questionnaire, the screen indicated to the participants that they had completed the study, should

now leave the computer lab quietly, and should go to the conference room to receive payment. An illustration of the programming screens for the experimental session are provided in Appendix C. A full copy of the questionnaire codebook is available in Appendix D.

When participants arrived for debriefing, the researcher asked for the index card containing the participant ID number and laptop number. This information was used to look up the participant's payment. The participant was then paid and asked to sign the receipt book regarding payment. The actual purpose of the study was then revealed to the participant. Here is the script used for the debriefing:

> "As we are still in the process of conducting this study, it is really important that you keep information about this study confidential and don't discuss it with anyone else.
>
> In this study, we are trying to understand what causes people to be motivated and perform well on a task. The groups in this study were simulated and all were rated as having average performance. We were most interested in how your compensation influenced your performance.
>
> If you would like more information regarding this study, we can e-mail you a copy of the paper once it has been published."

Participants were also asked if they had any information about the study prior to arrival for the study session and given the opportunity to ask questions or provide feedback. After debriefing, the participant had completed the study.

Experimental Manipulations

As noted earlier, the study had 8 conditions. These conditions varied according to allocation rule (equality and equity), pay ceiling (low and high), and pay floor (low and high). Participants were randomly assigned to conditions. In selecting pay values, the potential total payout for approximately two hours in the lab was considered. Assuming minimum wage is viewed as appropriate, the average amount paid should be around $14 to $15 per participant. Another consideration for determining pay ceilings and floors was the resulting range (i.e.,

creating low floor, high ceiling conditions that were much larger than the high floor, low ceiling conditions). Thus, the pay floor values were $2 and $6 and the pay ceiling values were $8 and $12. This means that the range of payments received across all participants was between $4 and $24 since there were two sessions for which participants were paid. Table 8 shows the pay range-related condition information for one session.

Table 8

Pay Ceiling and Floor Conditions

	Pay Ceiling/Top End of Range	
Pay Floor/ Bottom End of Range	Low $8.00	High $12.00
Low $2.00	$2.00 - $8.00 Range = $6.00 Midpoint = $5.00	$2.00 - $12.00 Range = $10.00 Midpoint = $7.00
High $6.00	$6.00 - $8.00 Range = $2.00 Midpoint = $7.00	$6.00 - $12.00 Range = $6.00 Midpoint = $9.00

In addition to the pay conditions, the allocation rule was also manipulated, such that some individuals were paid under an equality allocation rule and others under an equity allocation rule. Participants were told that pay for the job they were doing ranged from a low value to a high value depending on their pay condition (see Table 8 above); they were also told that they had been assigned to a workgroup to complete the task and that the performance of the workgroup determined the pool available for payment. The participants were told that pay was either distributed to the group members equally (in equality conditions) or based on individual contributions (in the equity conditions). Following performance of the task, participants were informed of their payment and the payments of other group members. All participants were paid

based on membership in an average performing group. Thus, individuals in the equality conditions were paid based on equal distributions of the average group performance pool (all group members received the same payment). Participants in equity conditions were paid based on measurement of their actual performance (group members received different payments depending on performance). Table 9 lists the actual payments that were made during the study.

Table 9

Actual Study Payments

Pay Floor/ Bottom End of Range	Pay Ceiling/Top End of Range	
	Low/$8.00	High/$12.00
Low $2.00	Group Range: $16 - $64 Ind. Range: $2 - $8 Reward Pool for Average Performing Group of 8 = $40 Equity Condition: High Perf = $8, Average Perf = $5, Low Perf = $2 Equality Condition: All = $5	Group Range: $16 - $96 Ind. Range: $2 - $12 Reward Pool for Average Performing Group of 8 = $56 Equity Condition: High Perf = $12, Average Perf = $7, Low Perf = $2 Equality Condition: All = $7
High $6.00	Group Range: $48 - $64 Ind. Range: $6 - $8 Reward Pool for Average Performing Group of 8 = $56 Equity Condition: High Perf = $8, Average Perf = $7, Low Perf = $6 Equality Condition: All = $7	Group Range: $48 - $96 Ind. Range: $6 - $12 Reward Pool for Average Performing Group of 8 = $72 Equity Condition: High Perf = $12, Average Perf = $9, Low Perf = $6 Equality Condition: All = $9

The text for the manipulation was as follows. Items in bold were populated based on condition. As noted, the 'group' participants were in was a simulated group. Thus, each participant represented one observation.

Before Task Performance Sessions 1 & 2:

You will be working in a group with 7 other people to enter the information from the forms into the computer.

Pay is based on the performance of members of the group.

Individual performance is determined by the number of accurate entries made by an individual. For you, this is the number of accurate entries made in the income field.

Group performance is determined by the number of applications that can be processed and the accuracy of those applications.

To process an application, at least 6 of the 8 fields must be entered.

Your group can make between **[GROUP FLOOR #]** and **[GROUP CEILING #]**.

This money will be distributed to individual members of the group **[based on individual contributions - *OR* - equally].**

In other words, individual payments **[depend on individual performance - *OR* - are the same for everyone in your group].**

Since this money will be distributed **[based on individual contributions - *OR* - equally among group members]**, your payment **[is dependent on your performance as follows - *OR* - is dependent on the group's performance as follows]:**

- **High individual performance – you will receive [individual ceiling]**.
- **Average individual performance – you will receive [individual midpoint].**
- **Low individual performance – you will receive [individual floor]**.

- OR –

- **High performing group – you will receive [individual ceiling]**.
- **Average performing group – you will receive [individual midpoint].**
- **Low performing group – you will receive [individual floor]**.

Measures

Ability was measured as the number of correct entries made during the training performance session. The expectancy components and motivation were measured using self-reported responses (see survey measures below). The performance dependent variable was measured subjectively (self-reported, see survey measures below) and objectively. The objective performance measure was the number of accurate entries in the income field by the participant during the TASK1 session.

Survey Measures

Questionnaires were administered at six points during the session. For the purposes of testing the hypotheses from Chapter 2, survey measures were collected related to the TASK1 session. Survey measures were used for the following variables: effort to performance expectancy, performance to pay expectancy, valence of pay, motivation, and subjective performance. See the codebook in Appendix D for all measures collected during the study.

For effort to performance expectancies, performance to pay expectancies and motivation, participants were asked to: "Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1)." Responses to items were on 5 point Likert scales ranging from *strongly disagree* to *strongly agree*. The effort to performance expectancy and performance to pay expectancy scales were adapted from scales used in a study described in Djurdjevic (2013).

Effort to performance expectancy was measured using the following five items:

1. How well I do on this task depends on how much effort I put into it.
2. The effort that I put into this task is not related to my performance on this task. (Reverse Coded)
3. If I try hard, I will do well on this task.
4. There is a good chance that my performance will be high on this task.
5. If I put my mind to it, I should be able to perform this task well.

Performance to pay expectancy was measured using the following five items:

1. The better I perform on this task, the more money I will make.
2. How much money I make depends on how well I perform this task.
3. It is likely that I will make more money if I perform well on this task.
4. If I perform well, I will make more money.
5. My performance on this task will not affect how much money I make. (Reverse Coded)

Motivation was measured in the pilot study using ten items:

1. I hope I do really well here.
2. I am very motivated to do well on this task.
3. I feel driven to do well on this task.
4. I really want to do well.
5. I am highly motivated to do well on this task.
6. I couldn't care less whether or not I perform well in this session. (Reverse Coded)
7. I am motivated to perform well on this task.
8. I don't care whether or not I do well here. (Reverse Coded)
9. I'm really not motivated to do well on this task. (Reverse Coded)
10. I do not care about my performance on this task. (Reverse Coded)

The measure was then reduced to the following five items for the full study (for details on this reduction, see Pilot Testing later in this chapter):

1. I am very motivated to do well on this task.
2. I feel driven to do well on this task.
3. I really want to do well.
4. I am motivated to perform well on this task.
5. I do not care about my performance on this task. (Reverse Coded)

For the pay valence associated with the pay ceiling, participants responded to three items on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree*. Specifically, the participants were asked to: "Please indicate how much you agree or disagree with each of the following regarding the maximum amount you can make for the task you will be performing (TASK1)." The valence scale was also adapted from scales used in a study described in Djurdjevic (2013). The following three items in response to this question were used for the pay valence scale:

1. I would really like to make this much money.
2. I want to make this amount of money.
3. I really value this amount of money.

Subjective performance was measured using 2 questions after performing the task, but before pay information and performance feedback was given. Question 1 asked the following, "How would you rate your performance on the task (TASK1)?" with responses on a 5-point scale ranging from *poor* to *excellent*. Question 2 asked the following, "Individual performance is rated as Low, Average, or High. Where do you expect your individual performance will be rated for TASK1?" with responses on a three point scale of *low*, *average* and *high*.

Pretest

Pretesting was completed in June 2013. Eight PhD students went through the entire program from a participant perspective to assess the flow and capacity of the task program and to provide suggestions for improvement. There were not any incentives at this stage. Data from this run through were not used for any analyses. Rather, feedback given during a group roundtable discussion session of the PhD students was used to improve the study design.

Feedback from pretesting lead to two primary updates to the program. First, the training video was revised to provide a stronger sense of the group nature of the task (see Appendix B for the final video slides and script). Second, the program had a capacity issue that would not allow it to run for all participants at once. This was corrected prior to pilot testing.

Pilot Test

Pilot testing was completed in June 2013 with four objectives: 1) a full run through of the study to ensure logistical efficiency and computer operation, 2) a test of the manipulations, 3) a test of measure reliability, and 4) a test of the appropriateness of performance cutoffs. Undergraduate students in business courses were provided extra credit for participation in the

pilot study. They were also paid for participation based on their condition, and in equity conditions, individual performance.

Logistical Efficiency and Computer Operation

Twenty-nine undergraduates participated in the pilot study. Regarding the full run through of the study, undergraduates were comfortable with the operation of the program and were able to navigate the various screens. The training video was effective as most participants completed the task as described.

The most significant issue that arose in the pilot study related to the participant experience involved the participant ID number entry. One participant entered the ID incorrectly, leading to problems with the manipulation/payout process. Thus, a new protocol was added that participants would write their ID themselves on the sign in form to confirm they read it correctly, and they would be told at sign in, "the participant ID number must be entered correctly so that we can pay you at the end of the study."

Manipulation Checks

Manipulation checks confirmed that participants were aware of the compensation policies for the task. Most participants correctly entered their minimum and maximum pay amounts (i.e., the floors and ceilings). Tables 10 and 11 provide the frequency of responses by condition. For ceilings, 86% of participants in the low ceiling condition and 87% of participants in the high ceiling condition entered the correct value when asked to fill in the blank for the statement, "The most money I can make in this session is $_____." For floors, 100% of participants in the low floor condition and 93% of participants in the high floor condition entered the correct value when asked to fill in the blank for the statement, "The minimum amount of money I can earn during this session is $_____."

Table 10

Pilot Response to Ceiling Manipulation Check

Item: The most money I can make in this session is $_____. -Enter Dollar Amount Here		
Response	Low *N*=14	High *N*=15
8	12	0
	85.71%	0.00%
12	0	13
	0.00%	86.67%
16	0	1
	0.00%	6.67%
64	2	0
	14.29%	0.00%
96	0	1
	0.00%	6.67%

Table 11

Pilot Response to Floor Manipulation Check

Item: The minimum amount of money I can earn during this session is $_____. -Enter Dollar Amount Here		
Response	Low *N*=15	High *N*=14
2	15	0
	100.00%	0.00%
6	0	13
	0.00%	92.86%
48	0	1
	0.00%	7.14%

When ceilings and/or floors were entered incorrectly, it was primarily due to participants incorrectly entering the group minimum and maximum. To correct for this, when running the full experiment, group minimum and maximum pay questions were added next to the individual

minimum and maximum manipulation checks. This was to help the participants distinguish between the group ceiling/floor and the individual ceiling/floor in their responses.

The means for the allocation rule manipulation checks were also in the expected directions. Mean responses on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree* to the item, "Pay on this task is based on my individual performance," were significantly higher in the equity condition (M=3.92, N=13) than in the equality condition (M=2.75, N=16), $F(1, 27)=9.54$, $p<0.01$. Mean responses on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree* to the item, "Pay on this task is based on my group's performance," was significantly higher in the equality condition (M=4.50, N=16) than in the equity condition (M=3.38, N=13), $F(1, 27)=7.75$, $p<0.05$. See Table 12 for allocation rule manipulation checks.

Table 12

Allocation Rule Manipulation Checks

Item	Condition	*N*	Mean	Std. Deviation
Pay on this task is based on my group's performance.	equality	16	4.50	0.73
	equity	13	3.38	1.39
Pay on this task is based on my individual performance.	equality	16	2.75	0.93
	equity	13	3.92	1.12

Measure Reliability

The third purpose of the pilot study was to assess the measurement items for the variables in the study. For both effort to performance expectancies and for performance to pay expectancies, each five item scale had high internal consistency (E→P expectancy α=0.84;

P→Pay expectancy α=0.89), and all items were included for the final study. Table 13 and Table 14 provide detailed information for each of the items.

Table 13

Effort to Performance Expectancy Item Descriptive Statistics

Item (*N*=29)	Mean	Std. Deviation
How well I do on this task depends on how much effort I put into it.	4.28	0.75
The effort that I put into this task is not related to my performance on this task. (Mean is based on the item after it was recoded)	3.93	1.07
If I try hard, I will do well on this task.	4.38	0.62
There is a good chance that my performance will be high on this task.	4.34	0.77
If I put my mind to it, I should be able to perform this task well.	4.59	0.50

Table 14

Performance to Pay Expectancy Item Descriptive Statistics

Item (*N*=29)	Mean	Std. Deviation
The better I perform on this task, the more money I will make.	4.38	0.82
How much money I make depends on how well I perform this task.	3.93	1.03
It is likely that I will make more money if I perform well on this task.	4.41	0.63
If I perform well, I will make more money.	4.31	0.81
My performance on this task will not affect how much money I make. (Mean is based on the item after it was recoded)	3.28	0.70

Regarding the motivation measure, ten items were included in the pilot test, but this was reduced to five items for the full experiment as feedback from participants indicated some survey fatigue. The ten item measure had high internal consistency (α=0.96). Items with the strongest intercorrelations, and thus contributing to internal consistency were selected for inclusion in the

full study. See Table 15 for detailed information regarding the motivation items included in the pilot study.

Table 15

Motivation Item Descriptive Statistics

Item (*N*=29)	Mean	Std. Deviation	Item Used for Full Study
I hope I do really well here.	4.55	0.74	
I am very motivated to do well on this task.	4.28	0.96	X
I feel driven to do well on this task.	4.24	0.95	X
I really want to do well.	4.38	0.94	X
I am highly motivated to do well on this task.	4.17	0.97	
I couldn't care less whether or not I perform well in this session. (Mean is based on the item after it was recoded)	3.79	1.32	
I am motivated to perform well on this task.	4.28	0.96	X
I don't care whether or not I do well here. (Mean is based on the item after it was recoded)	4.10	0.98	
I'm really not motivated to do well on this task. (Mean is based on the item after it was recoded)	3.72	1.31	
I do not care about my performance on this task. (Mean is based on the item after it was recoded)	4.14	0.99	X

Subjective performance was measured using two items: “How would you rate your performance on the task (TASK1)?” with responses on a 5-point scale ranging from *poor* to *excellent* and “Individual performance is rated as Low, Average, or High. Where do you expect your individual performance will be rated for TASK1?” with responses on a 3-point scale of *low*, *average* and *high*. The coefficient alpha for the two subjective performance items was 0.69. The correlation for these two items was 0.60 for the pilot study. These low values may be because the 3-point scale is limited while the 5-point scale allows for finer distinctions. No participants

selected low for their performance level for the 3-point scale question. Both items were included for the full study. Since the two items were on difference scales, for analysis purposes, both items were standardized and then combined. The coefficient alpha based on the standardized items was 0.75. See Table 16 for item descriptive statistics.

Table 16

Performance Item Descriptive Statistics

Item (*N*=29)	Mean	Std. Deviation
How would you rate your performance on the task (TASK1)? (5-point response scale)	3.72	0.84
Where do you expect your individual performance will be rated for TASK1? (3 point response scale)	2.62	0.49

Three items were included for pay valence in the full study, but were not tested as part of the pilot study. This was because the decision to measure the pay valence directly in relationship to the pay maximum, which is truer to the expectancy theory application used here, was made after the pilot study was completed. Initially, the questionnaire simply asked questions regarding the valence of pay, in general, without reference to the maximum. Direct questions about the pay maximum value were a better representation of the pay valence construct in the high effort motivational force equation, and were used for the full study.

Performance Cutoffs

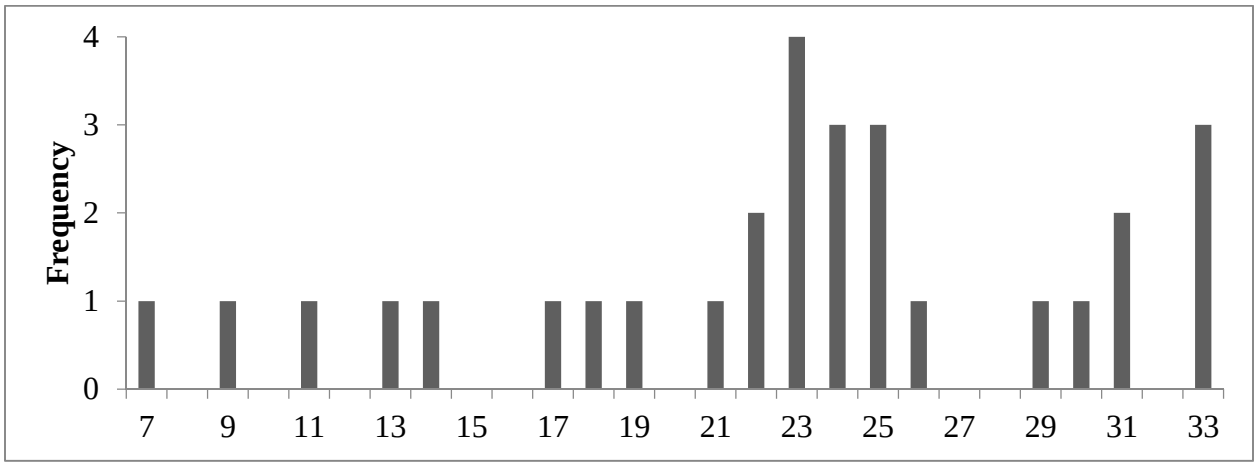
Regarding performance cutoffs (i.e., the number of accurate entries in the income field required for each level of performance), the distribution of correct entries during the pilot was considered in order to set the performance cutoffs for the full study. Performance cutoffs were not critical to testing of the hypotheses in Chapter 2, but were important for paying participants and for running the full study. For pretesting and pilot testing, performance cutoffs were set as

follows: Low = 0 to 14 correct entries; Average = 15 to 19 correct entries; High = 20 or more correct entries.

The distribution of performance for the pilot study is provided in Figure 8. Based on this distribution, performance cutoffs were adjusted to ensure a distribution of low and high performers across conditions.

Figure 8

Pilot Study Performance Distribution



Based on the pilot study performance levels, the following cutoffs were established for the full experiment: Low = 0 to 22 correct entries, Average = 23 to 26 correct entries, High = 27 or more correct entries.

Funding

The average payment for participation in this study was approximately $15. Funding for payments to participants and other miscellaneous expenses was provided by the James H. Penick Endowment ($10,000) and the SHRM Foundation Dissertation Grant Award ($5,000).

CHAPTER 4

RESULTS

Overview

The hypotheses developed in Chapter 2 were tested using the data collected according to the methods described in Chapter 3. The results of these tests are reported here. Before reporting the results of the hypothesis tests, the sample is described, manipulation checks are reported, and the psychometric properties of variables are discussed.

Study Sample

The sample for this study was made up of 584 undergraduate business students at a large university. Student participants were recruited in classrooms and were all given extra credit for participation in the study. Sixty-two percent of participants reported their sex as male, and 78 percent reported their race as white. The average reported participant age was 21 years old.

Of 584 participants in the study, the data for 16 participants were removed from the analysis. There were two reasons for which an observation was removed. First, some participants were repeat participants, such that the second observation would not be independent (N=3). Second, there were some technical difficulties that led to removal of observations (N=13). The primary technical issue occurred during one session when the server disconnected, which prevented data from being recorded. Other technical issues were specific to laptop failures. The analysis described here is based on the remaining 568 participants.

Confirmatory Factor Analysis

Allocation rule, pay ceiling and pay floor were all manipulated variables. Individual ability and objective individual performance were measured based on the count of correct entries for the training and first paid task sessions, respectively. All mediators of the model and the

subjective individual performance measure were measured using multiple survey response items. Thus, a confirmatory factor analysis was conducted to assess the construct validity of the items used for the mediators and subjective performance measures. In addition, variables were inspected to ensure they met parametric testing assumptions.

Prior to running any analysis, three items were re-coded (e.g., 1 was recoded to 5; 2 was recoded to 4, and so on), so that the measurement scales would match other items tapping the construct. The reverse coded item for E→P expectancy was "The effort that I put into this task is not related to my performance on this task." The reverse coded item for P→Pay expectancy was "My performance on this task will not affect how much money I make." The reverse coded item for motivation was "I do not care about my performance on this task."

A confirmatory factor analysis (CFA) was completed to ensure items used to measure each construct were related to the intended construct, and not cross-loading onto other related constructs. The analysis was complete in AMOS 20.0 (Arbuckle, 2011). Missing information limits the capability of AMOS to run full analyses. Some cases had missing responses on items and had to be excluded for analysis in AMOS. For the CFA, 558 cases were included. The reduction made for the CFA was not required for the hypothesis tests described later in this chapter. The CFA involved five parts – individual model fit, convergent validity, reliability, discriminant validity, and full measurement model fit.

Individual Construct Model Fit

Model fit for each construct was assessed by separately analyzing the measurement model for each construct to the extent possible. In some cases, the latent variable had less than four items, requiring fit to be assessed with two latent variables at a time. Significant χ^2 values indicate poor model fit when sample sizes are small or medium (Byrne, 2010). For large sample

sizes, significant χ^2 values are likely and are not a good indicator of model fit. Thus, to assess model fit, alternative fit measures were also used with cutoff criteria based on Hu and Bentler (1999). Specifically, *CFI* values greater than 0.95, *SRMR* values less than 0.08, and *RMSEA* values less than 0.06 were treated as indications of good model fit.

For the full five item E→P expectancy scale, the RMSEA value was greater than 0.06 and the χ^2 *p*-value was less than 0.001. To determine the item that may be problematic, the items were reviewed to assess their connection to the underlying construct.

E→P Expectancy Items:

1. How well I do on this task depends on how much effort I put into it.
2. If I try hard, I will do well on this task.
3. *There is a good chance that my performance will be high on this task.*
4. If I put my mind to it, I should be able to perform this task well.
5. The effort that I put into this task is not related to my performance on this task. (R)

From a review of the items, one item in the E→P expectancy scale appeared to be a poor fit conceptually. Specifically, responses to the item, "there is a good chance that my performance will be high on this task" could be based on one's overall motivation rather than exclusively one's beliefs that effort leads to performance. After removing the item from the analysis, model fit improved. For the four item E→P expectancy scale, all fit indicators were within recommended limits. *CFI* and *SRMR* values continued to be acceptable. χ^2 *p*-values and *RMSEA* values were improved and acceptable (χ^2 *p*-value>0.05; *RMSEA* = 0.05).

For the P→Pay expectancy scale, the RMSEA value was also greater than 0.06 and the χ^2 *p*-value was less than 0.001. Similar to what was done for E→P expectancy, the P→Pay expectancy items were reviewed to assess their connection to the underlying construct.

P→Pay Expectancy Items:

1. The better I perform on this task, the more money I will make.
2. *How much money I make depends on how well I perform this task.*
3. It is likely that I will make more money if I perform well on this task.
4. If I perform well, I will make more money.
5. My performance on this task will not affect how much money I make. (R)

The second item was somewhat inconsistent with a conceptual definition. Specifically, responses to the item, "How much money I make depends on how well I perform this task" seemed to include both P→Pay expectancy (i.e., the belief that pay was tied to performance) and the size of the pay. That is, rather than simply being a probability, this value indicated an amount in a more distinct way than the other items. The last item "My performance on this task will not affect how much money I make" had a similar issue, but it was not necessary to remove additional items as the model fit improved and all model fit indices were satisfactory against the cutoffs after removing one item ("How much money I make depends on how well I perform this task" was removed, all other items were retained).

For the motivation scale, fit with the five item scale was acceptable. Thus, no items were removed from the scale. For pay valence and subjective performance, there were less than four items for each construct, so these constructs could not be analyzed individually. This is because there would not be enough degrees of freedom to assess model fit (Kline, 2011). The four item P→Pay expectancy measure had very good fit, so each construct was run separately with the four item P→Pay expectancy measure to allow for a test of fit. All alternative fit indices for all three constructs were acceptable. See Table 17 for fit information for each model.

Table 17

Model Fit

Latent Construct	# of Items	χ^2 (df)	χ^2 *p*-value	*CFI*	*SRMR*	*RMSEA*
E→P Expectancy	5	23.18 (5)	<0.001	0.98	0.03	0.08
E→P Expectancy	4	5.20 (2)	0.07	0.99	0.02	0.05
P→Pay Expectancy	5	56.15 (5)	<0.001	0.95	0.04	0.14
P→Pay Expectancy	4	1.53 (2)	0.47	1.00	0.01	<0.001
Motivation	5	6.05 (5)	0.30	1.00	0.01	0.02
Pay Valence (with four item P→Pay Expectancy)	3	25.78 (13)	0.02	0.99	0.03	0.04
Subjective Performance (with four item P→Pay Expectancy)	2	10.50 (8)	0.23	1.00	0.02	0.02

Convergent Validity

Values for the average variance extracted (AVE) were calculated for all latent constructs according to the method used above. That is, the AVE was calculated based on the model of the construct alone if possible. When the item had fewer than four items, the model was run with the construct and the four item P→Pay expectancy construct. AVE represents the amount of variance in observed measures due to the latent construct rather than error. A value greater than 0.5 indicates an acceptable AVE value (Kline, 2011) as it indicates the latent construct explains more variance than error. Average variance extracted values for all scales, except the E→P expectancy scale, were acceptable (P→Pay = 0.52; Motivation = 0.65; Pay Valence = 0.71; Subjective Performance = 0.61).

The AVE for the four item E→P expectancy scale was problematic. Specifically, the AVE for the four item measure was 0.42. Analysis indicated that the item, "The effort that I put into this task is not related to my performance on this task," had a poor factor loading with a

standardized lambda of 0.32 and a squared multiple correlation value of 0.10. This poor factor loading explained the low AVE. This item was removed and the model was reanalyzed. Since the removal of this item lead to a less than 4 items, the construct was analyzed with the P→Pay expectancy construct to ensure sufficient degrees of freedom. The reanalyzed model had an improved AVE for E→P expectancy (i.e., above the 0.50 threshold, AVE = 0.52) and the model fit was acceptable (χ^2 (13) = 42.95; *p*-value <0.001; *CFI* = 0.98; *SRMR* = 0.04; *RMSEA* = 0.06).

A final indicator of convergent validity are lambda values. If the standardized lambda values (i.e., the standardized regression weights) are greater than 0.30 and the unstandardized values are significant, this is an indication of convergent validity (Hair, Anderson, Tatham, & Black, 1998). All of the separate models had lambda values that were acceptable.

Reliability

Coefficient alpha is a common measure of reliability that can be run in SPSS for each variable separately. Coefficient alpha is a measure of the inter-correlation of items that is sensitive to the number of items (i.e., it increases as the number of items increases, Nunnally & Bernstein, 1994). The coefficient alpha values indicated acceptable levels of reliability. All values exceeded the 0.70 value (E→P = 0.76; P→Pay = 0.74; Pay Valence = 0.84; Motivation = 0.89; Subjective Performance = 0.75). The alpha reported for subjective performance is based on the standardized items, since the items were standardized prior to creating the variable for hypothesis testing.

Table 18

Reliability

Construct	Coefficient Alpha
E→P Expectancy	0.76
P→Pay Expectancy	0.74
Pay Valence	0.84
Motivation	0.89
Subjective Performance	0.75

Discriminant Validity

There are two approaches that can be used to demonstrate discriminant validity across constructs. The first is the pairwise χ^2 difference test. In this test, a model with two constructs is analyzed unconstrained where the correlation between the latent constructs is free to vary and then constrained (i.e., nested) where the correlation between the latent constructs is restricted to 1. If there is a significant difference between the χ^2 values for the two models, such that the unconstrained model is a better fit than the constrained model, this provides evidence for discriminant validity. Essentially, this indicates that allowing the constructs to be conceptually distinct is superior to treating them as equivalent. A series of comparisons was run. For all comparisons, it was found that the unconstrained model was a significantly better fit than the constrained model (see Table 19). According to this test, there was discriminant validity across the construct measures.

The second approach is the Fornell-Larcker test (Fornell & Larcker, 1981). This test can be run when the full measurement model is analyzed (i.e., the model that includes all measures and constructs). Thus, this test is discussed next in the full measurement model section.

Table 19

χ^2 Difference Tests of Discriminant Validity

	Unconstrained		Constrained/ Nested		χ^2 Difference Test		
Construct Pairing	χ^2	*df*	χ^2	*df*	χ^2 Difference	*df*	p-value
E→P & P→Pay	42.95	13	169.50	14	126.55	1	<0.001
E→P & Motivation	36.18	19	97.33	20	61.15	1	<0.001
E→P & Pay Valence	18.02	8	367.08	9	349.06	1	<0.001
E→P & Subjective Performance	1.42	4	222.50	5	221.08	1	<0.001
P→Pay & Motivation	61.41	26	522.74	27	461.33	1	<0.001
P→Pay & Pay Valence	25.78	13	673.93	14	648.15	1	<0.001
P→Pay & Subjective Performance	10.50	8	248.81	9	238.31	1	<0.001
Motivation & Pay Valence	35.30	19	926.31	20	891.01	1	<0.001
Motivation & Subjective Performance	11.04	13	245.43	14	234.39	1	<0.001
Pay Valence & Subjective Performance	3.32	4	242.62	5	239.30	1	<0.001

Full Measurement Model Fit

All constructs were combined to test overall model fit, assess convergent validity, and assess discriminant validity within the context of the full measurement model. E→P expectancy and P→Pay expectancy were analyzed based on the shortened scales. Overall model fit of the full model was acceptable (χ^2 (109) = 201.46, p<0.001; *CFI* = 0.98; *SRMR* = 0.04; *RMSEA* =

0.04). See Figure 9 for the full measurement model. Standardized lambda values are represented by the arrows from the latent construct to the indicators.

Based on the full model, the standardized AVEs were acceptable for all latent constructs (E→P = 0.52; P→O =0.52; Motivation = 0.65; Pay Valence = 0.71; Subjective Performance = 0.62) and standardized lambdas were all acceptable (> 0.30, Hair et al., 1998), indicating convergent validity.

Running the full model did identify a problem with discriminant validity. The Fornell-Larker test involves comparison of the AVE values to correlation values. If the AVE value is less than the correlation squared value, discriminant validity is questionable (Fornell & Larcker, 1981). When this threshold is not met, it indicates that shared variance between latent constructs is greater than the shared variance of the observed measures for their own construct. The results of the Fornell-Larker test are presented in Table 20. The test indicates that E→P expectancy may not have discriminant validity from the P→Pay expectancy and motivation variables. Specifically, the AVE values for E→P expectancy (0.52) and motivation (0.65) were less than the squared correlation value for the latent variables (0.74). In addition, the AVE values for E→P expectancy (0.52) and P→Pay expectancy (0.52) were less than the squared correlation value for the latent variables (0.54).

Figure 9

Full Measurement Model

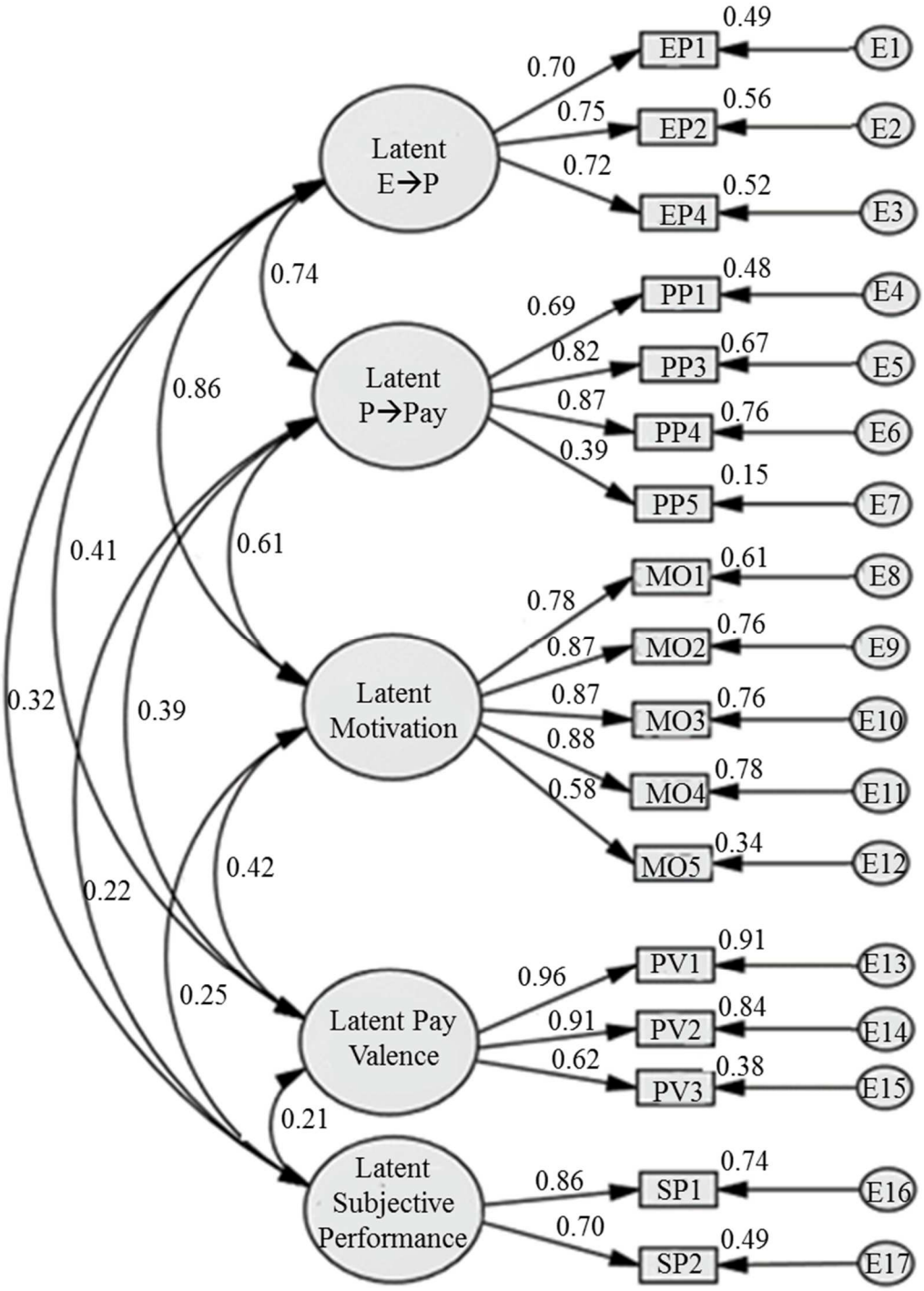


Table 20

Fornell-Larker Test Matrix

	E→P Expectancy	P→O Expectancy	Motivation	Pay Valence	Subjective Performance
E→P Expectancy	*0.52*	0.74	0.86	0.41	0.32
P→O Expectancy	0.54	*0.52*	0.61	0.39	0.22
Motivation	0.74	0.37	*0.65*	0.42	0.25
Pay Valence	0.16	0.15	0.17	*0.71*	0.21
Subjective Performance	0.10	0.05	0.06	0.04	*0.62*

Note. Values based on standardized weights; AVE values are along the diagonal; correlations are above the diagonal; squared correlations are below the diagonal.

Summary

The confirmatory factor analysis provided evidence of the following. One, items from the E→P expectancy variable and the P→Pay expectancy scales were dropped due to poor fit and variance explained. Two, there was strong evidence for convergent validity and reliability for all variables after items were removed for E→P expectancy and P→Pay expectancy. Three, there was evidence for discriminant validity for all variables, though this evidence was somewhat weaker for E→P expectancy. For this variable, there was support for discriminant validity via the χ^2 difference test; however, the more conservative Fornell-Larker test indicated that the E→P expectancy measure may not have sufficient discriminant validity. The evidence seemed sufficient for analyzing the model proposed; however, caution is urged in interpretation of the findings around the E→P expectancy variable.

Based on this analysis, variables for hypothesis testing were constructed as follows. Variables were computed as means of item responses on 1 to 5 scales for E→P expectancies (three items), P→Pay expectancies (four items), motivation (five items), and pay valence (three items). Because the scales for subjective performance were different (i.e., one question was on

5-point scale and the other was on a 3-point scale), the responses were standardized, and the mean of the two standardized responses was calculated. For objective performance, a count of correct entries during the task session was used. For ability, correct entry counts during the training session (prior to manipulation information) were used.

Tests of Analytic Assumptions

Completing parametric tests (i.e., multiple regression and ANOVA) is more effective when the sampling distribution is normal and variances are homogeneous across conditions (Field, 2009). Thus, variables were tested for homogeneity of variance and normality prior to hypothesis testing.

Homogeneity of Variance

The homogeneity of variance assumption concerns the variance of variable values across conditions. The variance should not differ significantly across conditions. All measured variables were tested for homogeneity of variance.

To test for homogeneity of variance, Levene's test can be used (Levene, 1960). If Levene's test is significant, it indicates that variances differ across condition. All tests were not significant. Thus, we can assume homogeneity of variance for all variables across conditions. See Table 21 for the results of the test for each variable.

Table 21

Homogeneity of Variance Tests

Variable	Levene Statistic (*F*)	*df1*	*df2*	*p*-value
Training Performance	1.05	7	560	0.40
Pay Valence	0.35	7	560	0.93
E→P Expectancy	0.72	7	560	0.66
P→Pay Expectancy	0.64	7	560	0.72
Motivation	0.21	7	560	0.98
Subjective Performance	1.10	7	560	0.36
Objective Performance	0.30	7	560	0.95

Normality

By testing for normality of sample data, it is possible to infer whether the sampling distribution is normal (Field, 2009). The data for all variables were tested for normality visually and using skewness and kurtosis statistics.

To check for normality visually, frequency distributions and P-P plots (i.e., probability-probability plots) were constructed. Comparison of the frequency distribution to the normal curve provides a visual representation of the extent of non-normality. Visual inspection of the frequency distributions led to concern regarding the normality of the E→P expectancy, P→Pay expectancy, and pay valence measures. These distributions are presented in Figures 10, 11, and 12. The distributions for all variables appeared negatively skewed.

Figure 10

E→ P Expectancy Histogram

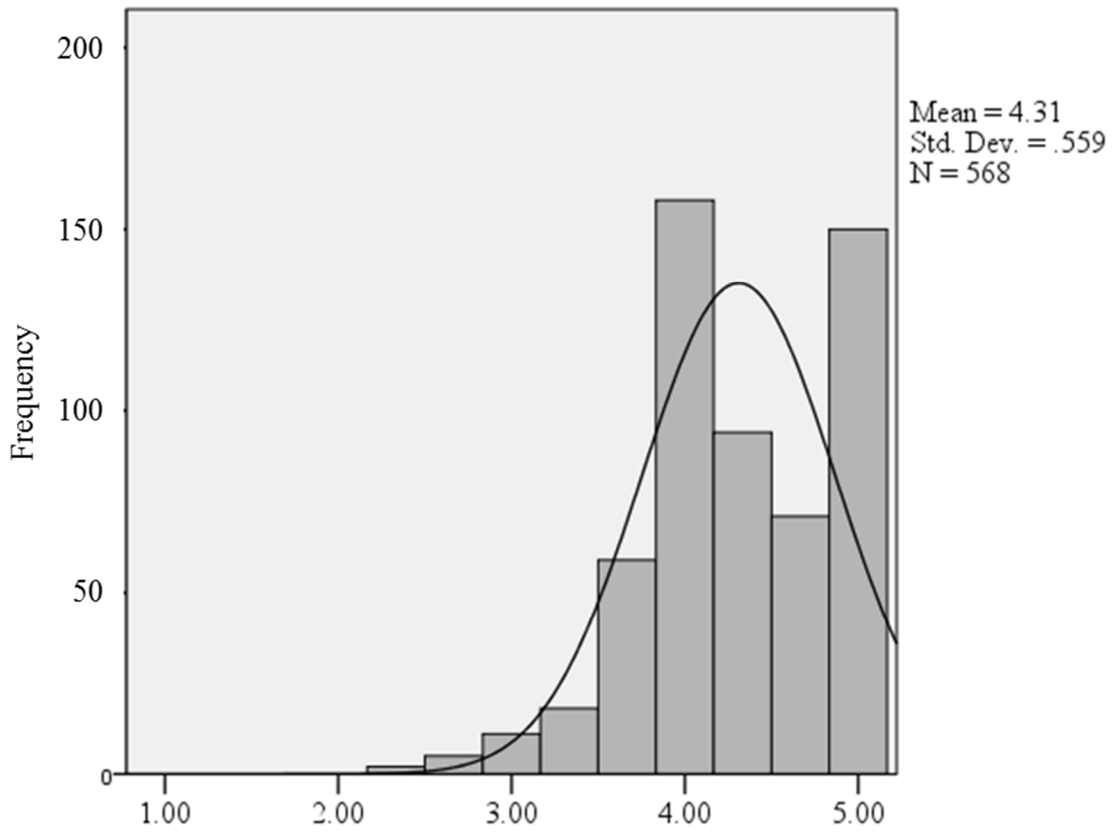


Figure 11

P→Pay Expectancy Histogram

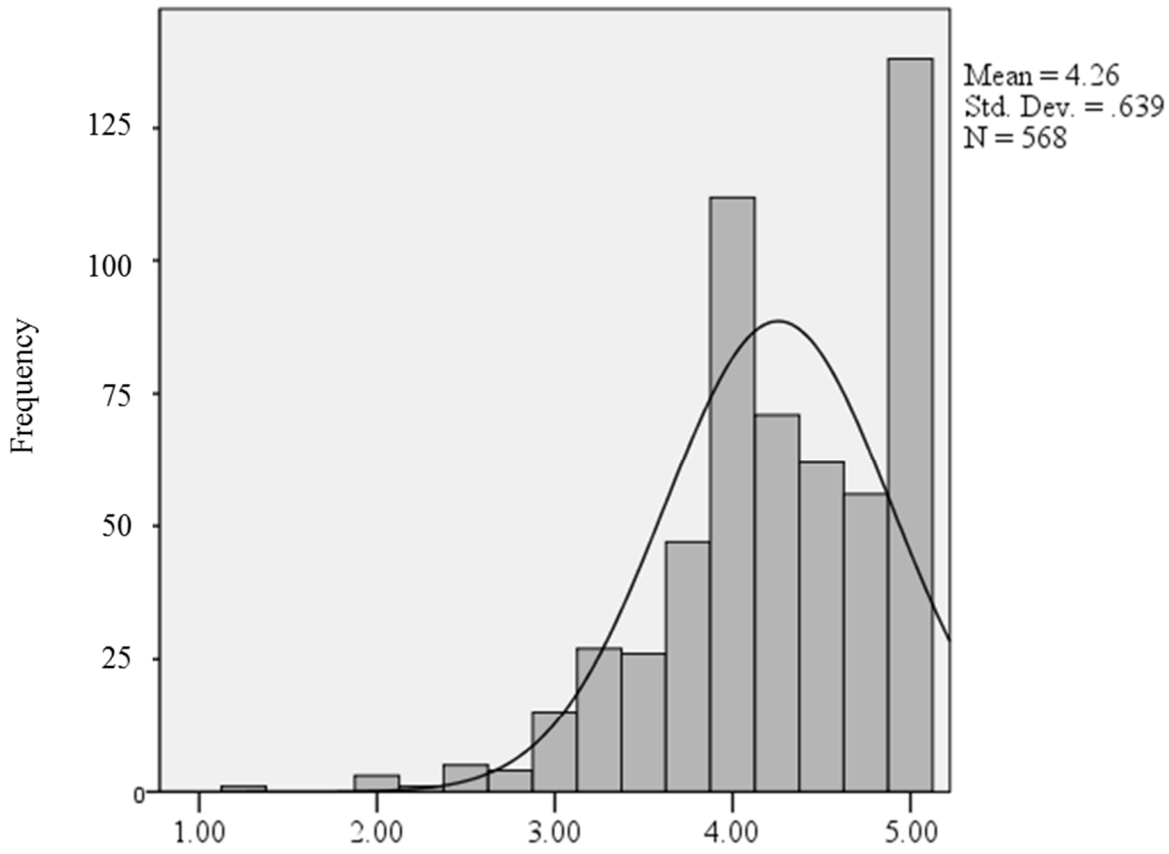
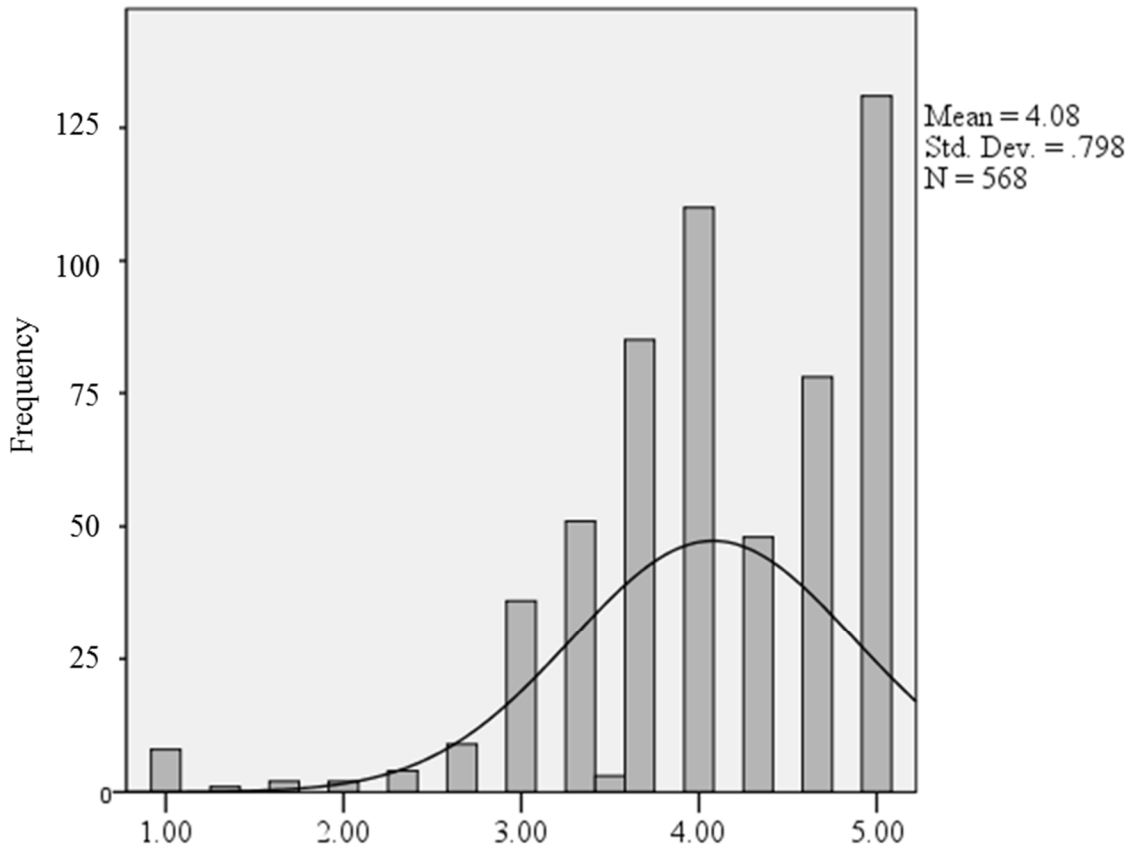


Figure 12

Pay Valence Histogram



Inspections of P-P plots, however, only raised concerns about the objective performance variable. When data on the P-P plots fall along the line, there is evidence that the data are normal. When they do not, there may be an issue with the normality of the data. See Figure 13 for the P-P plot for objective performance. The individual performance count distribution is provided in Figure 14.

Figure 13

P-P Plot for Objective Performance

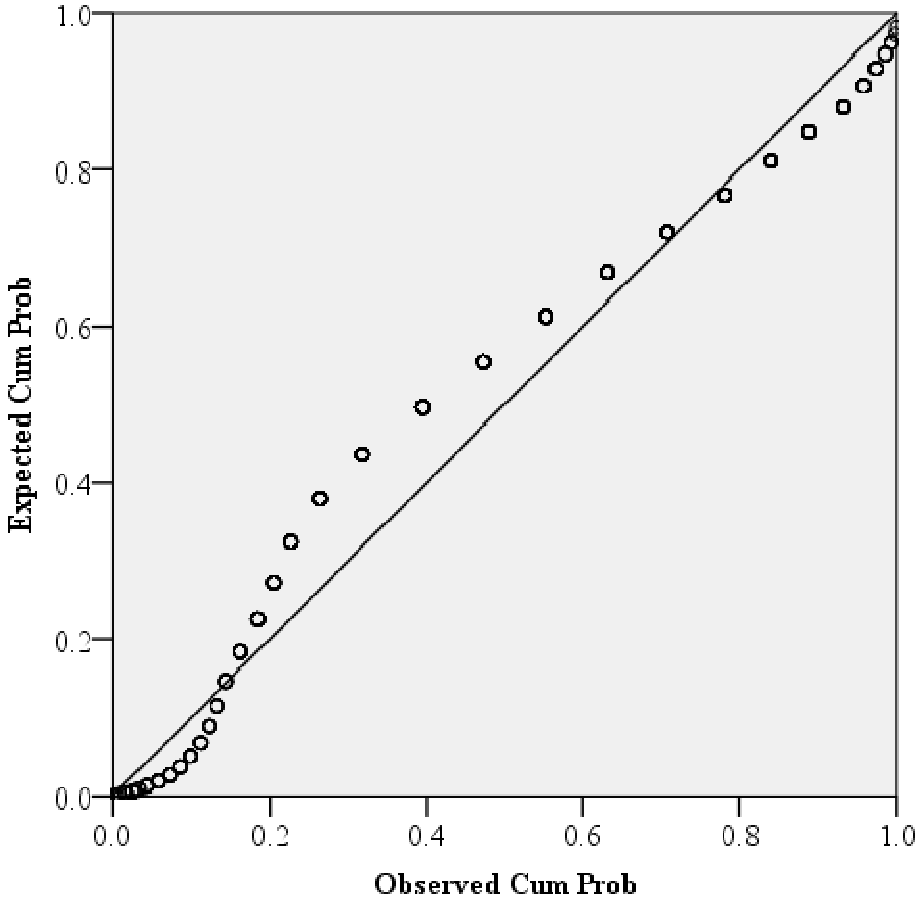
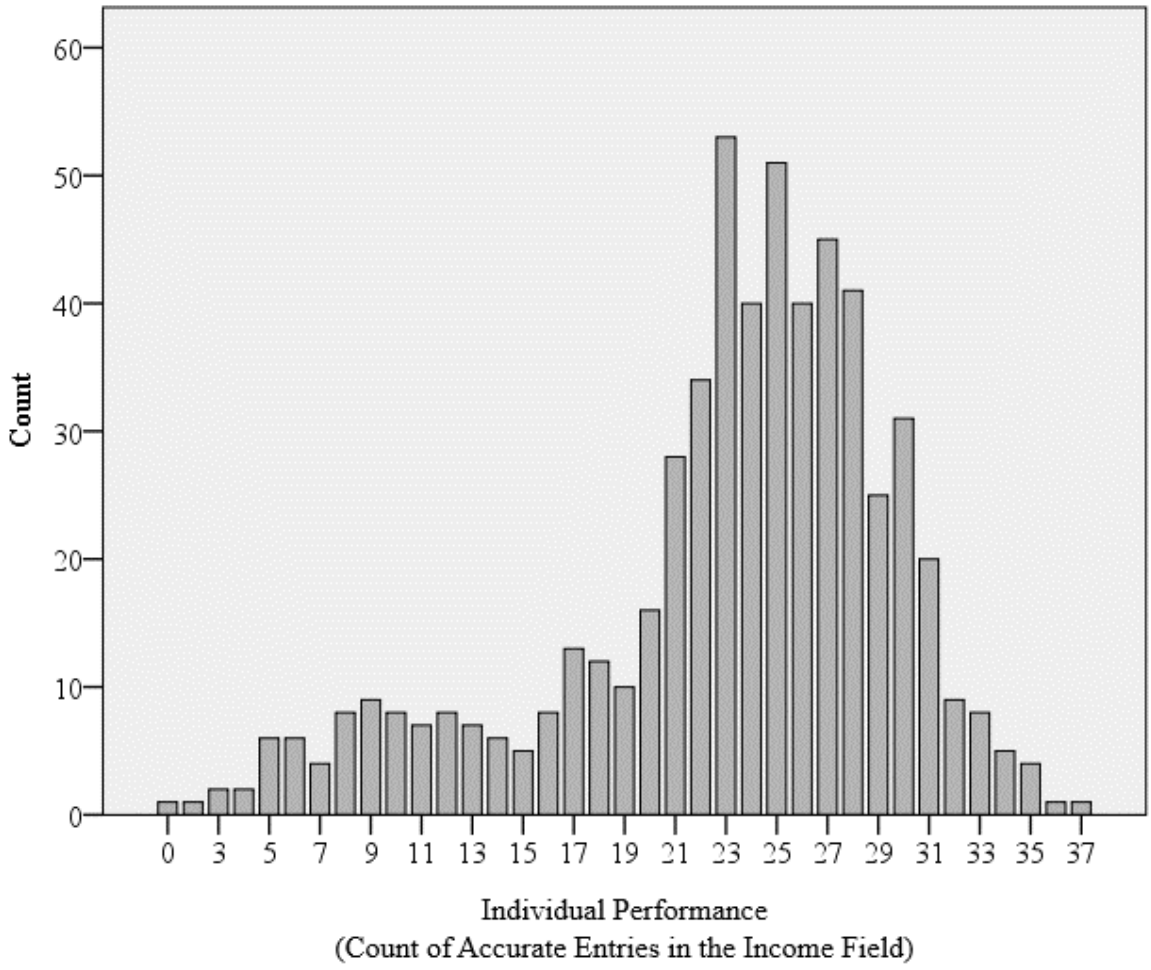


Figure 14

Individual Performance Histogram



The results overall were rather ambiguous as to whether normality was a serious concern. To further investigate normality, kurtosis and skewness quantitative values were analyzed and are presented in Table 22. Standardized kurtosis and skewness values reported in SPSS were assessed for deviations from 0. Skewness and kurtosis values were a concern for objective performance and pay valence. For objective performance, the absolute skewness value was greater than 1. For pay valence, absolute skewness and kurtosis values were both greater than 1.

Table 22

Skewness and Kurtosis Values

Variable	Skewness	*SE*	Kurtosis	*SE*
Ability	-0.77	0.10	0.27	0.21
E→P Expectancy	-0.48	0.10	-0.06	0.21
P→Pay Expectancy	-0.83	0.10	0.90	0.21
Pay Valence	-1.05	0.10	1.92	0.21
Motivation	-0.80	0.10	0.64	0.21
Subjective Performance	-0.05	0.10	-0.84	0.21
Objective Performance	-1.01	0.10	0.75	0.21

With experimental design, non-normality is primarily a concern within conditions. That is, with 8 conditions, normality should be checked in each condition before concluding that it is a concern. Thus, separate normality checks were run for each condition for the pay valence and objective performance variables. This check of skewness and kurtosis once again confirmed an issue with normality for both variables. See Table 23 for the values by condition. Overall, the pay valence and objective performance measures remained the only concern. The problems found in the data indicate that two approaches were possible to correct for normality issues 1) outliers could be dropped from the analysis, or 2) the data could be transformed.

Table 23

Skewness and Kurtosis by Condition

Condition	Variable	*N*	Skewness	*SE*	Kurtosis	*SE*
1	Pay Valence	69	-0.86	0.29	2.02	0.57
	Objective Performance	69	-0.94	0.29	0.43	0.57
2	Pay Valence	73	-0.95	0.28	0.71	0.56
	Objective Performance	73	-1.24	0.28	1.66	0.56
3	Pay Valence	73	-1.31	0.28	3.51	0.56
	Objective Performance	73	-0.70	0.28	-0.10	0.56
4	Pay Valence	71	-0.26	0.29	-1.34	0.56
	Objective Performance	71	-0.96	0.29	0.67	0.56
5	Pay Valence	70	-0.89	0.29	1.84	0.57
	Objective Performance	70	-1.23	0.29	1.99	0.57
6	Pay Valence	74	-1.56	0.28	3.75	0.55
	Objective Performance	74	-1.08	0.28	0.85	0.55
7	Pay Valence	70	-0.78	0.29	1.14	0.57
	Objective Performance	70	-1.09	0.29	0.71	0.57
8	Pay Valence	68	-1.39	0.29	2.55	0.57
	Objective Performance	68	-1.10	0.29	1.36	0.57

Outliers. One of the potential explanations for non-normality is outliers. For pay valence and objective performance, box plots for outliers in each condition were analyzed. Both sets of plots indicated outliers below the mean. In addition, z-scores were calculated for each case with respect to the condition (i.e., the group) mean and standard deviation. For pay valences, ten cases were more than 3 standard deviations from the group mean. For objective performance, three cases were more than 3 standard deviations from the group mean. Outliers were all below the mean (see Figures 12 and 14 for the distributions). This suggests that the overall non-normality of the data may be due somewhat to these outliers creating negative skew. It is possible for there was an ability ceiling to the number of correct entries that could be made in the

time provided while motivation likely explains extreme outliers at the bottom of the distribution. Another explanation for low values may be that individuals were trying to help group members by entering value in other fields (e.g., entering down payment).

Transformations. Both the pay valence and objective performance variables were negatively skewed (i.e., had a left tail) and kurtotic (i.e., had peaks above a normal distribution). To address this violation, data transformations were investigated.

Box-Cox transformations are the ideal transformation for increasing the normality of data (Osborne, 2010). A Box-Cox transformation specifically identifies the transformation needed based on the shape of the sample data rather than applying a more general transformation, such as the square root or the natural log. The appropriate transformation for each variable was identified using SPSS syntax provided in Osborne (2010). The ideal λ for objective performance was found to be 2.3; for pay valence, the ideal λ was found to be 2.8. Skewness and kurtosis values were improved using the Box-Cox transformation. For objective performance, the revised variable had a skewness value of 0.0, a kurtosis value of -0.24 and a correlation with the untransformed performance variable of 0.97. For pay valence, the transformed variable had a skewness value of 0.01, a kurtosis value of -1.102, and a correlation with the untransformed pay valence variable of 0.96.

Selected Strategy. Based on the analysis, outlier deletion or data transformation both had potential to improve the results of the analysis. At the same time, both of these approaches have drawbacks. Removal of outliers means removing real data points from the sample data. Data transformations may complicate interpretation of results, especially when both a mediating variable and outcome variable undergo a transformation. In this case, the Box-Cox transformations would be different for more than one variable, further confusing interpretations.

The central limit theorem indicates that when samples are sufficiently large, we can make normality assumptions about the sampling distribution regardless of the normality of the data collected (Field, 2009). The data collected here have over 60 observations per condition, far above the requirements of the central limit theorem.

In order to deal with the issues aforementioned, hypotheses were tested in three ways. First, data were analyzed using all original data with no outlier removal or transformations made. Second, data were analyzed with both sets of outliers removed. Third, data were analyzed with both pay valences and objective performance measures transformed using the Box-Cox transformation. Findings were generally consistent across tests (see Table 31 at the end of this chapter for a comparison), and the unchanged dataset provides for easier interpretation and inference. Thus, the results reported here are based on the full, unchanged dataset. Deviations from these findings are noted in the text and in Table 31.

Manipulation Checks

Manipulation checks were conducted to ensure that participants were aware of the compensation policies for the task. Most participants correctly entered their minimum and maximum pay amounts (i.e., the floor values and ceiling values). For ceilings, 94% of participants in the low ceiling condition and 87% of participants in the high ceiling condition entered the correct value when asked to fill in the blank for the statement, "The most money I, individually, can make in this session is $___." Results of a one-way ANOVA also indicate that individuals recognized the size of the pay ceiling. The values for the high ceiling condition (M=\$13.40) were significantly higher than the values for the low condition (M=\$8.80) (F(1, 566)=60.85, p<0.001).

For floors, 92% of participants in the low floor condition and 92% of participants in the high floor condition entered the correct value when asked to fill in the blank for the statement, "The minimum amount of money I, individually, can earn during this session is $___." One-way ANOVA results indicate that the values for the high floor condition (M=$7.09) were significantly higher than the values for the low condition (M=$2.73) ($F$(1,566)=75.19, p<0.001).

The means for the allocation rule manipulation checks were also in the expected directions. Mean responses on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree* to the item, "Pay on this task is based on my individual performance," were significantly higher in equity conditions (M=3.72) than in equality conditions (M=2.80) (F(1, 566)=111.75, p<0.001). Mean responses on a 5-point Likert scale ranging from *strongly disagree* to *strongly agree* to the item, "Pay on this task is based on my group's performance," were significantly higher in equality conditions (M=4.43) than in equity conditions (M=3.57) (F(1, 566)=119.79, p<0.001).

Correlations

Means, standard deviations, and correlations are presented in Table 24.

Table 24

Means, Standard Deviations, and Correlations

Variable	Mean	*SD*	1	2	3	4	5	6	7	8	9
1. Ability	6.92	2.68									
2. Allocation Rule	0.50	0.50	0.00								
3. Ceiling	0.50	0.50	0.01	0.00							
4. Floor	0.50	0.50	0.09*	-0.01	-0.02						
5. E→P Expectancy	4.31	0.56	0.17***	0.03	0.00	-0.01					
6. P→Pay Expectancy	4.26	0.64	0.15***	0.14**	-0.01	-0.02	0.54***				
7. Pay Valence	4.08	0.80	0.08*	-0.02	0.10*	-0.04	0.35***	0.30***			
8. Motivation	4.30	0.61	0.17***	0.00	0.05	0.00	0.72***	0.49***	0.40***		
9. Subjective Performance	0.00	0.90	0.15***	-0.03	0.00	-0.10*	0.23***	0.15***	0.19***	0.21***	
10. Objective Performance	23.07	6.74	0.58***	0.07ŧ	0.02	0.00	0.14**	0.13**	0.09*	0.13**	0.22***

Note. ŧp<0.10; *p<0.05; **p<0.01; ***p<0.001 (2-tailed), N=568

Hypothesis Tests

Main and Interaction Effects of Pay Policies on Performance Hypotheses

To test the relationship between pay range, allocation rules, and performance (hypotheses 1, 2, and 3), the manipulated variables were entered as fixed factors in a univariate ANOVA with individual performance entered as the dependent variable. The hypotheses were tested for both the subjective performance and the objective performance dependent variables. Regarding the entry of the pay range, pay ceilings and pay floors were both entered as fixed factors. Different inferences can be drawn depending on which factors are significant at predicting performance. A significant relationship between pay ceiling and performance would indicate that the ceiling of the range drove the performance effect while a significant relationship between the pay floor and performance would indicate that the floor of the range drove the performance effect.

Based on this analysis, none of the manipulations or their interactions had a significant relationship with objective individual performance. For subjective performance, the floor of the pay range had a significant effect. Specifically, high floors had lower subjective performance (on a standardized scale, M=-0.09) than low floors (M=0.09) ($F(1, 560) = 5.68$, $p<0.05$). Overall, this analysis indicated that allocation rules were not significantly related to performance outcomes while pay range, and specifically pay floors, explained subjective performance outcomes. Thus, based on the full, untransformed dataset, hypotheses 2 and 3 were not supported while hypothesis 1 received partial support with the floor of the pay range affecting self-reported performance levels.

Interestingly, the analysis completed on the transformed objective performance variable and the analysis completed with outliers deleted, resulted in significant findings for the allocation rule and objective performance relationship. Specifically, equity allocation rules (M=23.83,

based on the outlier deletion method) had significantly higher mean correct income entries than equality allocation rules (M=22.60, based on the outlier deletion method; $F(1, 548) = 4.85$, $p<0.05$). Thus, based on the transformed and outlier deletion datasets, hypothesis 2 received partial support.[1]

Expectancy Component Hypotheses

Hypotheses 4 through 6 addressed the effects of ability, allocation rules, and ceilings on the components of expectancy theory. Hypothesis 4 predicted that ability would be positively related to E→P expectancy. Ability was a continuous variable rather than an experimental condition, so this relationship was tested by regressing E→P expectancy on ability. The relationship was positive and significant, supporting hypothesis 4 (B =0.04, SE=0.01, β=0.17, $p<0.001$). Ability explained 3 percent of the variance in E→P expectancy. An increase in one correct entry during the ability training session was related to a 0.04 increase in reported E→P expectancy.

Since allocation rules and ceilings were all experimental manipulations, separate ANOVAs were run to test their effects. Hypothesis 5 predicted that P→Pay expectancies were higher in equity allocation rule conditions than in equality allocation rule conditions. There was a significant effect of allocation rule on P→Pay expectancies ($F(1, 566) = 12.00$, $p<0.01$). P→Pay expectancies were higher in equity allocation rule conditions (M=4.35) than equality allocation rule conditions (M=4.17). The partial eta squared was 0.02, which can be interpreted as an indication that 2 percent of the variance in P→Pay expectancies could be explained by the allocation rule.

[1] Analyses of a subset of data that included only the widest range ($2-$12) and the narrowest range ($6-$8) did not yield any findings beyond those reported above.

Hypothesis 6 predicted that the mean valence of ceilings in the high ceiling condition would be significantly higher than the mean valence of ceilings in the low ceiling condition. There was a significant effect of ceiling condition on valences of ceilings ($F(1, 566) = 5.69$, $p<0.05$). The valences of high ceilings ($M=4.16$) were higher than valences of low ceilings ($M=4.00$). The partial eta squared was 0.01, which can be interpreted as an indication that 1 percent of the variance in pay valences could be explained by the ceiling condition.

Ability and pay policy components were significant predictors of expectancy components in the expected directions. Thus, hypotheses 4 through 6 were all supported, although the effect sizes were quite small.

Motivation Hypotheses

Hypotheses 7 through 9 predicted that the expectancy components for exerting high effort levels (i.e., E→P expectancies, P→Pay expectancies, and pay valences) would be positively related to motivation. Regression analysis was used to test these hypotheses. Motivation was entered as the dependent variable and E→P expectancy, P→Pay expectancy, and pay valence were all entered as independent variables. The main effects of the expectancy factors explained 55 percent of the variance in motivation. The overall model of direct effects was significant ($F(3, 564) = 233.95$, $p<0.001$).

Each of the components was significant. E→P expectancies were positively related to motivation ($\beta=0.60$, $p<0.001$), supporting hypothesis 7. P→Pay expectancies were positively related to motivation ($\beta=0.12$, $p<0.001$), supporting hypothesis 8. Pay valences were positively related to motivation ($\beta=0.15$, $p<0.001$), supporting hypothesis 9. See Table 25 for the regression results.

Table 25

Hypotheses 7, 8, and 9 Regression Results

	Motivation		
Variable	*B*	SE	β
Constant	0.50	0.15	
E→P Expectancy	0.66	0.04	0.60***
P→Pay Expectancy	0.12	0.03	0.12***
Pay Valence	0.12	0.02	0.15***
R^2	0.55		
Adj. R^2	0.55		
N	568		

Note. ***p<0.001

One concern raised from the CFA was that the E→P variable may be indistinguishable from the P→O variable. Thus, multicollinearity statistics were reviewed for the regression analysis. Tolerance statistics for all variables were greater than 0.20 (E→P = 0.67; P→Pay = 0.69; Valence = 0.86), indicating that a problem of multicollinearity was unlikely (Field, 2009). VIF statistics were below 10 (E→P = 1.49; P→Pay = 1.45; Valence = 1.16), another indication that multicollinearity was not a serious concern (Hair et al., 1998).

Hypothesis 10 predicted interaction effects of the expectancy theory components on motivation. Models that exclude important variables and interaction terms are misspecified (Cohen, Cohen, West, & Aiken, 2003). Thus, the motivation regression was completed with all interaction terms included. That is, a full regression including all variables from hypotheses 7 through 10 was completed. This analysis provided a complete model of motivation using the expectancy components.

To test the interaction effects, E→P expectancy, P→Pay expectancy and pay valence were first mean-centered. These mean-centered terms were then multiplied to create interaction terms (hypothesis 10a: E→P * P→Pay; hypothesis 10b: P→Pay * pay valence; hypothesis 10c: E→P * pay valence; hypothesis 10d: E→P * P→Pay * pay valence. All main effects were entered in step 1 (i.e., E→P, P→Pay, pay valence), two-way interaction effects were entered in step 2 (hypotheses 10a, 10b, and 10c), and the three-way interaction effect was entered in step 3 (hypothesis 10d).

In step 1 the three expectancy components from hypotheses 7, 8, and 9 (E→P, P→Pay, Pay Valence) remained significant, explaining 55 percent of the variance in motivation. In step 2, two of the two-way interactions were significant and one was not. Specifically, the P→Pay expectancy by pay valence interaction (β=0.14, p<0.001), and the E→P expectancy by pay valence interaction (β=-0.11, p<0.01) were both significant. The E→P expectancy by P→Pay expectancy was not significant. The addition of two-way interactions explained an additional 1.3 percent of the variance in motivation (F Change (3, 561) = 5.60, p<0.01). In step 3, the three way interaction was not significant. The full regression results are presented in Table 26.

Table 26

Hypothesis 10 Regression Results

	Motivation		
	Model 1	Model 2	Model 3
Variable	β	β	β
Step 1			
E→P Expectancy	0.60***	0.60***	0.60***
P→Pay Expectancy	0.12***	0.11***	0.12**
Pay Valence	0.15***	0.17***	0.18***
Step 2			
E→P x P→Pay		-0.06	-0.07
P→Pay x Pay Valence		0.14***	0.12**
E→P x Pay Valence		-0.11**	-0.11**
Step 3			
E→P x P→Pay x Pay Valence			-0.05
R^2	0.55	0.57	0.57
ΔR^2		0.01	0.00
N		568	

Note. *p<0.05; **p<0.01; ***p<0.001

Based on the lack of significance, hypotheses 10a and 10d were not supported. Hypotheses 10b and 10c could possibly be supported as the interaction terms were significant for each. In order to determine if the hypotheses were supported, it was necessary to assess the nature of the interaction. Thus, the interactions for 10b and 10c (see Figures 15 and 16) were plotted. The plot for hypotheses 10b indicated that the hypothesis was supported (Figure 15). Specifically, the positive P→Pay motivation relationship was not present when the pay valence was below the mean. This was confirmed by a simple slopes test at pay valence values of -0.8, 0, 0.8, where 0 is the mean value, -0.8 represents one standard deviation below the mean, and 0.8

represents one standard deviation above the mean. Below the mean, the P→Pay slope was not significant (*p*=*ns*); at the mean, the slope was significant (*p*<0.01); above the mean, the slope was significant (*p*<0.001). In other words, when the pay valence was low, there was not a positive P→Pay and motivation relationship.

The plot for hypothesis 10c indicated that the hypothesis was not supported (see Figure 16). Interestingly, the E→P expectancy and motivation relationship was positive for both high and low pay valences; however, in each case, the moderator (i.e., pay valence) appeared to strengthen the E→P and motivation relationship as it *declined.* Thus, the nature of the interaction indicates that hypothesis 10c is not supported. Only hypothesis 10b was supported.

Figure 15

P→Pay Expectancy and Pay Valence Interaction Plot

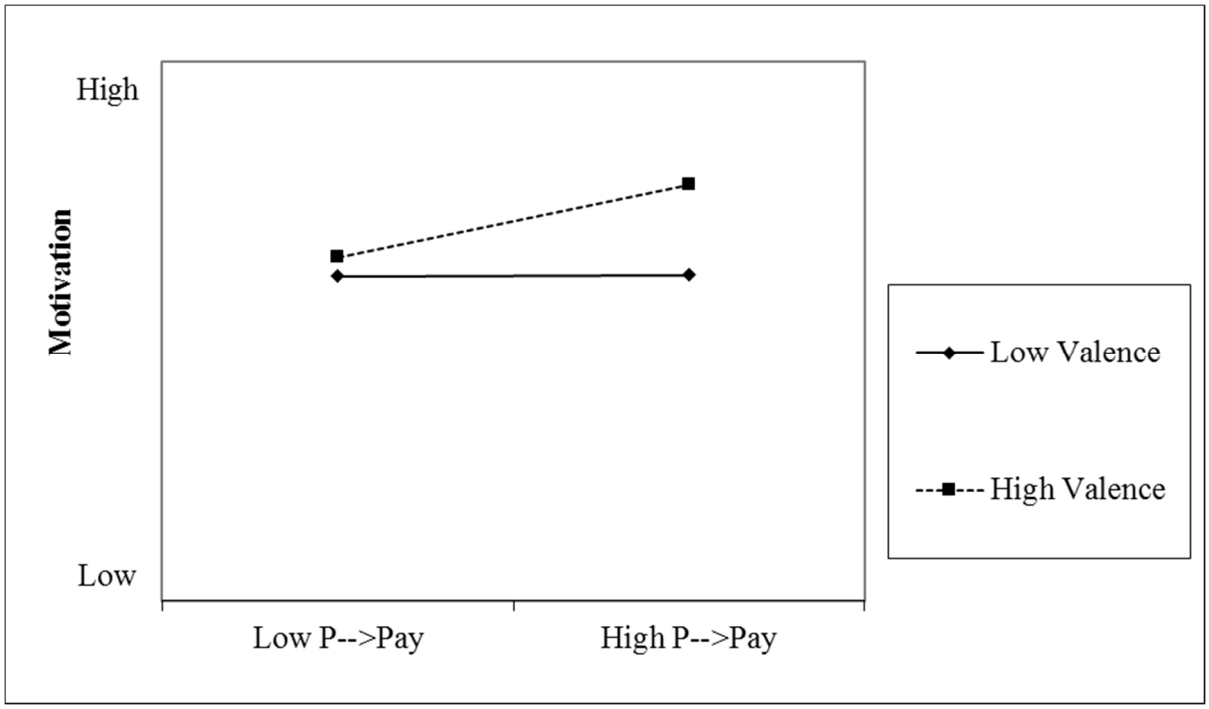
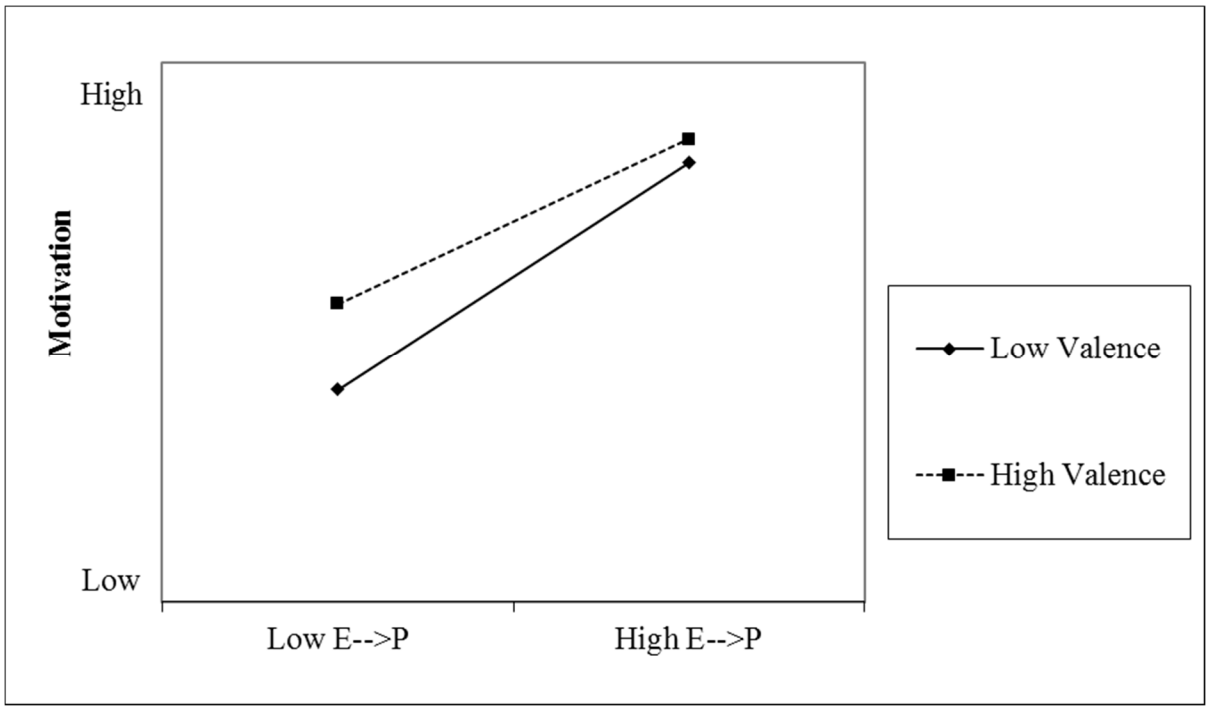


Figure 16

E→P Expectancy and Pay Valence Interaction Plot



Overall, the regression tests provided support for the P→Pay by pay valence interaction (hypothesis 10b), and no support for hypotheses 10a, 10c, and 10d.

Performance Hypotheses

Hypothesis 11 predicted that individual motivation would be positively related to individual performance. This hypothesis was tested for both the subjective performance and the objective performance dependent variables. First, the subjective performance dependent variable was regressed on motivation. Motivation explained 4.3 percent of the variance in subjective performance ($F(1, 566)=25.45$, $p<0.001$). The relationship between motivation and subjective performance was significant and in the expected direction. Specifically, increases in motivation were related to increases in reported performance ($B=0.31$, $SE=0.06$, $\beta=0.21$, $p<0.001$). Second, the objective performance dependent variable was regressed on motivation. Motivation

explained 1.8 percent of the variance in the objective performance measure ($F(1, 566)=10.23$, $p<0.01$). The relationship between motivation and objective performance was positive and significant ($B=1.47$, $SE=0.46$, $\beta=0.13$, $p<0.01$). Together, this analysis indicates support for hypothesis 11. Motivation has a positive relationship with both measures of performance though the effect sizes are quite small.

Hypothesis 12 made a similar prediction to hypothesis 11. However, rather than predicting a relationship between motivation and performance, a positive relationship between MF_{HE} (i.e., high effort motivation force) and performance was predicted. To test this, the E→P expectancy, P→Pay expectancy, and pay valence values were multiplied by one another to create a motivational force term. All variables were on 5-point scales. Checks for normality demonstrated that the motivational force term did not violate normality assumptions.

Performance measures were regressed on the motivational force term. For the subjective performance measure, high effort motivation force explained 5.8 percent of the variance in performance ($F(1, 566)=35.15$, $p<0.001$). The relationship between MF_{HE} and performance was significant and in the expected direction ($B=0.01$, $SE=0.001$, $\beta=0.24$, $p<0.001$). For the objective performance measure, MF_{HE} explained 2.1 percent of the variance ($F(1, 566)=12.17$, $p<0.01$). The relationship was positive and significant ($B=0.04$, $SE=0.01$, $\beta=0.15$, $p<0.01$). Together, this analysis indicates support for hypothesis 12. MF_{HE} has a positive relationship with both measures of performance. While the effect size is small, more variance in performance is explained by the MF_{HE} term than the motivation measure. The correlation between motivational force and motivation was 0.65.

Tests of Mediational Paths

Mediational paths were implicitly proposed based on the full model developed. Thus, in this section, mediational paths are tested. Mediation was tested using the Baron and Kenny (1986) approach. For this approach the model was separated into two parts, such that tests were conducted to test for 1) a mediating relationship between the independent variables and motivation through the expectancy components and 2) a mediating relationship between the expectancy components and performance.

The Baron and Kenny (1986) approach involves four steps. First, the relationship between the independent variable and the dependent variable is tested. If this relationship is significant, this is an indicator that a relationship exists and may be mediated. Second, the independent variable and the mediator are tested for a relationship. Third, controlling for the independent variable, the mediator and dependent variable relationship is tested. If the relationships in step 1, step 2 and step 3 are significant and in the direction predicted, then mediation is possible. The final step is to test for a relationship between the independent variable and the dependent variable while controlling for the mediator. If the relationship falls to non-significance, a case can be made for full mediation. If the relationship is small but still significant, partial mediation is established.

The first Baron and Kenny (1986) test conducted was of E→P expectancies as a mediator to the ability and motivation relationship. Step 1 required a significant bivariate relationship between ability and motivation. Referring back to Table 24, the correlation between ability and motivation was positive and significant (r=0.17, p<0.001). Step 2 required the ability and E→P relationship be significant. This relationship was tested for hypothesis 4 and was supported (β=0.17, p<0.001). For the third and fourth steps, both ability and E→P expectancy were entered

as independent variables in a multiple regression model with motivation as the dependent variable. This analysis indicated that E→P expectancy fully mediated the ability to motivation relationship. The E→P expectancy and motivation relationship remained significant (β=0.71, p<0.001) while the ability and motivation relationship became non-significant. See Table 27 for the analysis. A Sobel test was completed to confirm the mediated relationship (Sobel, 1982). Results support full mediation (t=3.95, p<0.001). E→P expectancy fully mediated the relationship between ability and motivation.

Table 27

Ability, E→P Expectancy, and Motivation Step 3 and 4 Regression Results

Variable	Motivation		
	B	SE	β
Constant	0.88	0.14	
Ability	0.01	0.01	0.05
E→P Expectancy	0.78	0.03	0.71***
R^2	0.52		
Adj. R^2	0.52		
N	568		

Note. ***p<0.001

Similarly, P→Pay expectancies were expected to mediate the allocation rule and motivation relationship. Step 1 required a significant bivariate relationship between allocation rule and motivation. Referring back to Table 24, the correlation between allocation and motivation was not significant. In addition, pay valences were expected to mediate the pay ceiling and motivation relationship. The bivariate relationship between pay ceiling and motivation was not significant, indicating there was not a mediated relationship. Overall, only the ability and motivation relationship was fully mediated by the expectancy theory components.

Testing the second part of the model, motivation was expected to mediate the relationship between the expectancy theory components and performance. Each expectancy component was tested using the Baron and Kenny (1986) method. Referring back to Table 24, the correlation between E→P expectancy and performance was positive and significant for both subjective (r=0.23, p<0.001) and objective (r=0.14, p<0.01) performance. The E→P expectancy and motivation relationship was tested for hypothesis 7 and was supported. For the third and fourth steps, both E→P expectancy and motivation were entered as independent variables in a multiple regression model with performance as the dependent variable (see Table 28). For subjective performance, E→P expectancy remained significant while motivation dropped to non-significance. For objective performance, neither E→P expectancy nor motivation were significant. Thus, there was not support for motivation as a mediator between E→P expectancy and performance.

Table 28

E→P, Motivation, and Performance Mediation Steps 3 and 4 Regression Results

Variable	Objective Performance	Subjective Performance
E→P Expectancy	0.08	0.17**
Motivation	0.07	0.09
R^2	0.02	0.06
Adj. R^2	0.02	0.05
N	568	568

Note. Standardized regression coefficients are reported; **p<0.01.

Next, motivation was tested as a mediator of the P→Pay expectancy and performance relationship. The correlation between P→Pay expectancy and performance was positive and significant for both subjective (r=0.15, p<0.001) and objective (r=0.13, p<0.01) performance,

indicating support for Step 1 of the Baron and Kenny (1986) test. Step 2 required the P→Pay expectancy and motivation relationship to be significant. This relationship was tested for hypothesis 8 and was supported. The bivariate correlation between the two variables was also significant (r=0.49, p<0.001). For the third and fourth steps, both P→Pay expectancy and motivation were entered as independent variables in a multiple regression model with performance as the dependent variable (see Table 29). For subjective performance, P→Pay expectancy dropped to non-significance while motivation remained significant. For objective performance, both P→Pay expectancy and motivation were non-significant. A Sobel test was completed to confirm the mediated relationship between P→Pay expectancy and subjective performance (Sobel, 1982). Results support mediation for subjective performance (t=3.62, p<0.001). Overall, this provides partial support for mediation; motivation mediated the relationship between P→Pay expectancy and subjective performance, but not the relationship for objective performance.

Table 29

P→Pay, Motivation, and Performance, Mediation Steps 3 and 4 Regression Results

Variable	Objective Performance	Subjective Performance
P→Pay Expectancy	0.08	0.06
Motivation	0.09	0.18***
R^2	0.02	0.05
Adj. R^2	0.02	0.04
N	568	568

Note. Standardized regression coefficients are reported; ***p<0.001.

Motivation was also expected to mediate the pay valence and performance relationship. For step 1, the correlation between pay valence and performance was positive and significant for both subjective (r=0.19, p<0.001) and objective (r=0.09, p<0.05) performance. Step 2 required

the pay valence and motivation relationship to be significant. This relationship was tested for hypothesis 9 and was supported. The bivariate correlation between the two variables was also significant (r=0.40, p<0.001). For the third and fourth steps, both pay valence and motivation were entered as independent variables in a multiple regression model with performance as the dependent variable (see table 30). For objective performance, pay valence dropped to non-significance while motivation remained significant. For subjective performance, both pay valence and motivation were both significant, indicating there may be partial rather than full mediation. The coefficient for pay valence and subjective performance dropped from the bivariate relationship. Results of the Sobel test support mediation for both objective performance (t=2.50, p<0.05) and subjective performance (t=3.29, p<0.001). Overall, there is support for motivation as a mediator of the pay valence and performance relationship.

Table 30

Pay Valence, Motivation, and Performance, Mediation Steps 3 and 4 Regression Results

Variable	Objective Performance	Subjective Performance
Pay Valence	0.04	0.13**
Motivation	0.12*	0.16**
R^2	0.02	0.06
Adj. R^2	0.02	0.05
N	568	568

Note. Standardized regression coefficients are reported; *p<0.05; **p<0.01.

The expectancy components were also expected to interact to predict motivation, which predicted performance, indicating motivation mediated the relationship between the interactions and performance. These relationships can also be tested using Baron and Kenny's (1986) method as well by testing the relationship between the interactions and the dependent variable (step 1), the relationship of the interactions with the mediator (step 2), and the relationship of the

mediator with the outcome variable when controlling for the interaction variable (steps 3 & 4). The only difference from the prior tests of mediation presented above is that for interactions, the lower order terms are entered in the regressions that include the interaction variable (Baron & Kenny, 1986; Muller, Judd, & Yzerbyt, 2005). This approach is sometimes called the "Moderated Causal Steps Approach" to testing first stage moderation (Edwards & Lambert, 2007, p. 5).

A check of support of prior hypotheses indicated that mediation for most interactions would not be supported and did not require further testing. The three-way interaction and motivation relationship was not supported (hypothesis 10d) and the relationships between the E→P interactions and motivation were not supported (hypothesis 10a and 10c). Thus, these first stage moderation relationships did not require further testing.

Only the P→Pay expectancy by pay valence interaction required further testing for first stage moderation since hypothesis 10c was supported. However, the P→Pay by pay valence interaction term did not have a significant relationship with the subjective or objective performance variables. Thus, there is not evidence that motivation mediates the relationship between the P→Pay by pay valence interaction and performance.

Follow-up Analyses

Based on the full model, the relationship between pay policies and individual performance may be best specified by controlling for individual ability. Ability is expected to both affect performance directly and through E→P expectancies. To isolate the pay policy motivational effect on performance, including ability in the model specification may be a better test. Thus, a follow-up test for hypotheses 1, 2, and 3 was conducted by entering ability as a covariate in a univariate ANOVA with individual performance as the dependent variable.

For objective performance, ability ($F(1, 562)=290.52$, $p<0.001$) and allocation rules ($F(1,562)=4.54$, $p<0.05$) were both significant predictors. Performance was higher for those high in ability versus those low in ability as would be expected. Equity allocation rules ($M=23.57$) had higher mean correct income entries than equality allocation rules ($M=22.58$), consistent with hypothesis 2.

For subjective performance, ability ($F(1, 562)=14.51$, $p<0.001$) and pay floors ($F(1, 562)=7.58$, $p<0.01$) were significant predictors. As with objective performance, performance was higher for those high in ability than for those low in ability. The high floor, as in the prior analysis, had lower mean subjective performance ratings (on a standardized scale, $M=-0.09$) than low floors ($M=0.09$). Overall, the evidence provided through direct tests suggests that ability is a consistent predictor of performance, that allocation rules significantly predict objective, but not subjective performance, and that pay floors significantly affect subjective, but not objective performance. There is no evidence to indicate that pay ceilings significantly affect performance outcomes.

Summary

A summary of the results for all hypotheses is provided in Table 31. The intention of this table is to demonstrate that findings are consistent across attempts to correct for potential problems in the data related to normality and outliers. As can be seen in the table, results were robust across remedies. The notable difference is that allocation rules are significant when the dependent variable is transformed, when objective performance outliers are removed from the analysis, and when ability is controlled for in the analysis. Overall, the results reported here indicate that the basic linkages were as hypothesized, while only a few of the interaction hypotheses were supported.

Table 31

Hypotheses Tests

	Reported *N*=568	Transformed Variables (Pay Valence & Objective Performance) *N*=568	Outlier Deletion *N*=556
Hypothesis 1	Not supported for objective performance Supported for floor and subjective performance	Not supported for objective performance Supported for floor and subjective performance	Not supported for objective performance Supported for floor and subjective performance
Hypothesis 2	Not supported; Supported in follow-up analysis with ability as a covariate	Supported for objective performance	Supported for objective performance
Hypothesis 3	Not supported	Not supported	Not supported
Hypothesis 4	Supported	Supported	Supported
Hypothesis 5	Supported	Supported	Supported
Hypothesis 6	Supported	Supported	Supported
Hypothesis 7	Supported	Supported	Supported
Hypothesis 8	Supported	Supported	Supported
Hypothesis 9	Supported	Supported	Supported
Hypothesis 10	10a: Not Supported 10b: Supported 10c: Not Supported 10d: Not Supported	10a: Not Supported 10b: Supported 10c: Not Supported 10d: Not Supported	10a: Not Supported 10b: Supported 10c: Not Supported 10d: Not Supported
Hypothesis 11	Supported	Supported	Supported
Hypothesis 12	Supported	Supported	Supported

Results about the relationship between ability and pay policies and expectancy equation components were all as hypothesized. Ability was related to E→P expectancies, equity allocation rules lead to higher P→Pay expectancies than equality allocation rules, and high pay ceilings had higher valences than low pay ceilings. Variance explained for each expectancy component by its respective predictor was less than 3 percent.

Motivation was well-explained by the expectancy components. In fact, 56 percent of the variance in motivation could be explained by E→P expectancy, P→Pay expectancy and pay valence. These relationships cannot be treated as causal since random assignment was applied to the pay policy conditions rather than the expectancy components; however, the power of the expectancy components in explaining motivation is an important contribution. Each component contributed significantly to explaining motivation when all were run in the same regression. E→P expectancy was the strongest in this relationship, but P→Pay expectancy and pay valence also contributed.

Interactions of the expectancy components added only 1.3 percent of variance explained in motivation. P→Pay expectancy interacted with pay valences according to the expectancy theory formulation. Motivation was flat across P→Pay expectancy levels when pay valences were low, but the P→Pay expectancy and motivation relationship was positive when pay valences were high. Interestingly, E→P expectancy also interacted with pay valence, but not in the way hypothesized. In fact, the slope of the E→P expectancy and motivation relationship was steeper when pay valence was low. One explanation for the lack of interaction findings is that the measures for the expectancy components had range restrictions issues, which reduces power (Aguinis & Stone-Romero, 1997). Specifically, the mean for E→P expectancy was 4.31 with a standard deviation of 0.56, the mean for P→Pay expectancy was 4.26 with a standard deviation of 0.64, the mean for pay valence was 4.08 with a standard deviation of 0.80, and the mean for motivation was 4.30 with a standard deviation of 0.61.

The performance hypotheses modeled the motivation and performance relationship two ways. In hypothesis 11, the five item motivation scale variable was treated as the predictor; in

hypothesis 12, the motivational force for high effort (per expectancy theory's formulation, Porter & Lawler, 1968; Vroom, 1964) was treated as the predictor.

Both approaches lead to a significant explanation of performance; however, the motivational force variable consistently explained a greater proportion of the variance in the performance dependent variable. This was the case across both performance measures. For objective performance, the five item motivation measure explained 1.8 percent of the variance while motivational force explained 2.1 percent. This may seem small, but in fact, the variance explained by motivational force was around 15 percent more than the variance explained by the five item motivation measure. For subjective performance, motivation explained 4.3 percent of the variance while motivational force explained 5.8 percent of the variance. The motivational force variance explained was around 30 percent higher than the variance explained by the five item motivation scale.

All of the model links, except for some of the interactions, were supported. Mediation test results were less supportive. Support was found for E→P expectancy as a mediator of the ability and motivation relationship. The other expectancy components did not mediate the relationship between pay policies and motivation. Interestingly, there was evidence that motivation mediated the relationship between both ceiling valances and P→Pay expectancies and performance measures. Motivation did not, however, mediate the relationship between E→P expectancies and performance measures. It is interesting that in the first set of mediational tests, mediation was not found for the pay policies, but in the second set of mediational tests, mediation was found for their associated expectancy components. Based on this set of tests, there is no evidence for a fully mediated path between pay policies and performance outcomes.

Still, the pay policies do appear to affect expectancy components in a causal way, and these components are important to motivation and performance outcomes.

CHAPTER 5

DISCUSSION

Overview

Despite an abundance of empirical work on the topic of pay variation, the accumulation of pay variation research has been inconclusive regarding the relationship between pay variation and performance outcomes (Conroy et al., in press; Shaw, 2014). As such, recent work has focused on revising theoretical frameworks to reveal the nuances of the pay variation construct and its relationship with organizational outcomes. Gupta et al. (2012) recognized the importance of the type and source of pay variation. Downes and Choi (2014) drew attention to employee reactions in response to pay variation. And Conroy et al. (in press) noted that cross-level issues of both the pay variation construct and its effects were important to work focusing on pay variation. Each of these papers raised important issues, but none conducted an empirical test. In this study, these more nuanced views of pay variation were recognized and taken into account. Boundary conditions established a central focus on horizontal performance-based pay variation. Individual reactions were tested. And rather than assuming pay variation was the same as allocation rules, it was treated as pay range using a pay policy approach.

Allocation rules were significantly related to objective individual performance, when controlling for ability and when outliers were removed from the analysis. Pay range did not have a significant relationship with objective individual performance while the floor of the pay range had a significant relationship with self-reported, subjective individual performance. In this section, I return to the original purposes of this study and discuss the findings within the context of the broader pay variation literature. Theoretical and practical implications are discussed and limitations are noted.

Theoretical Implications

The overarching purpose of this research was to investigate a number of underlying assumptions applied in research addressing the pay variation and firm performance relationship. Three specific assumptions were identified and tested: 1) the assumption that allocation rule arguments are appropriate for explaining pay variation's effects, 2) the assumption that pay variation has a relationship with individual motivation and performance, and 3) the assumption that pay variation is the cause of individual motivation and performance outcomes.

Allocation Rule Arguments Applied to Pay Variation

A central concern of this study was to distinguish equity/equality arguments from pay variation arguments. Comparing the theory and results for allocation rules and pay range provides compelling evidence that these are conceptually distinct policies and that using allocation rule arguments to explain pay variation's effects is questionable. In this study, pay range was manipulated as a separate variable from allocation rules. The arguments made for allocation rules differed from those for pay range. Allocation rules affected P→Pay expectancies while the pay range, and specifically the pay ceiling, affected the valence of the pay outcome for high effort. This leverage on different parts of the expectancy equation is one important piece of evidence indicating separation of these constructs and their theoretical arguments is important to pay variation research.

Furthermore, allocation rules had a reasonably consistent effect on objective individual performance while pay range did not have a significant effect. Perhaps what is rewarded is more influential in explaining behaviors than the size of the reward. Of course, there exist a limitless number of levels of pay range. The test presented here was based on one set of ranges. A potential explanation for the lack of a range effect is a common limitation in laboratory studies.

Specifically, the ranges used for this short-term study are of less importance than the ranges associated with one's professional career. The valence difference between a $1,000 bonus and a $10,000 bonus is likely to be much more influential than the difference between $2 and $12 for a short time period of work. Still, the reality that the allocation rule was influential but pay range was not certainly provides evidence of the difference and uniqueness of these constructs and the importance of treating them separately in pay research.

Considering these results in the context of the pay variation research stream provides some interesting implications. Many of the studies conducted on the pay variation and performance relationship have found a significant relationship between pay variation and performance, though whether this relationship is positive and negative varies (Ding, Akhtar, & Ge, 2009; Frick, Prinz, & Winkelmann, 2003; Lee et al., 2008; San & Jane, 2008). The significant findings of prior research combined with the lack of significant findings for pay range in this study raise the question: *what do the significant pay variation and firm performance findings of prior research actually represent?*

Much of the work that has reported a significant pay variation and firm performance relationship has not ensured that pay differences are based on performance, such that pay variations were likely the result of many factors. Pay variations may be indicative of seniority differences in seniority-based pay organizations, of favoritism when managers allocate pay, of variations in team performance in organizations that have team-based incentive pay, or variations in individual performance in organizations with individual performance-based pay (Conroy et al., in press; Gupta et al., 2012; Gupta & Jenkins, 1996). As noted in the Chapter 2 critique of the pay variation research, papers reporting a negative relationship may be conducted in contexts

where pay variation is based on non-performance factors or where performance-based pay is controlled.

Regarding papers reporting a positive relationship, in some cases, these papers address pay variation in performance-based pay contexts and address team-level performance outcomes (e.g., Simmons & Berri, 2011). When this occurs, the relationship that is found may actually be representative of allocation rules. Specifically, repeated implementation of an equity allocation rule on a team should lead to greater pay variation over time if the same individuals tend to have low and high performance. When empirical tests get closer to an allocation rule test (e.g., team-level tests, individual performance-based pay contexts), the effect of allocation rules may explain positive findings; when empirical tests move away from allocation rule tests (e.g., firm-level tests, controls for performance-based pay, lack of performance-based pay contexts, differences in within and between group distributions), negative relationships become more likely to emerge. Thus, some of the prior research on pay variation may actually test allocation rules in a distal way. Directly testing allocation rules would likely lead to clearer, more consistent results. The confounding of allocation rules, incentive intensity, pay basis and other factors helps to explain the variety of findings in the literature.

In all, the lack of clarity in the meaning of the pay variation construct seems to drive much of the confusion in this literature. Taking a different approach to measuring compensation policies may yield clarity for the field of compensation; it may also provide more consistent findings with greater effect sizes.

Pay Variation and Individual Performance

A second assumption tested in this study was the relationship between pay variation and individual motivation and performance. Specifically, it is often assumed that pay variation

influences individual outcomes and these outcomes can be aggregated to explain firm-level outcomes. A test of this argument has been lacking, however. In this study, the relationship between pay range and individual performance was tested to address this concern. The findings of this study support that, to some extent, individual responses are related to pay policies (e.g., expectancy components were affected by policies), though support for objective individual performance effects is less clear. Allocation rules appeared to have a relationship with objective performance while pay range, specifically pay floor, only affected subjective, or more precisely, self-reported performance.

As part of recognizing the difference between allocation rules and pay range, the difference between pay ceilings and pay floors within the pay range was addressed empirically. Subjective performance was related to pay range. Narrower pay ranges were associated with lower self-reported, individual performance than wider pay ranges. Because the study design allowed for separation of ceilings and floors, this finding can actually be interpreted as more nuanced. The ceiling did not have a significant effect on subjective, self-reported performance; rather the floors were related to self-reported, subjective performance. More specifically, when floors were low, subjective performance reports were higher than when floors were high.

In trying to understand the results for self-reported performance, it is possible that floors affect these reported values in either a conscious or an unconscious way. In comparing condition means, high floors had higher objective performance means and lower subjective performance means while low floors had lower objective performance means and higher subjective performance means. The relationships for objective performance are not significant, but it is interesting that the means are in opposite directions, indicating the possibility of intentional or unintentional inaccurate reporting.

One potential explanation for the finding that floors were influential is that when lower floors characterize the pay system, individuals may be more likely to 'fudge' estimates of their own performance in hopes that they will receive a higher pay amount. If this is the case, it may be that wider pay ranges encourage dishonest behaviors in an effort to avoid the lower end of the range. The repercussions of low performance (i.e., lower pay) may provide motivation to report higher performance levels (Lawler & Rhode, 1976). When participants reported their performance levels, they did not actually have knowledge of the performance measurement system. It seems possible that, given this uncertainty, some participants might have believed their own performance evaluation would determine their payouts.

Another possibility is that the floor engages a certain mindset around performance. For example, low floors may engage an avoidance motivation (e.g., a motivation to avoid pain, Elliot & McGregor, 2001). This avoidance motivation may be to avoid being the lowest performer and may manifest in self-reports that are somewhat inflated for low floors. Essentially, participants may not have consciously chosen to over-report performance, yet may have done so because of this underlying mindset.

Regardless, the issue with self-reported performance in a pay-for-performance system should encourage researchers to be careful of generalizing self-reported performance findings to objective performance implications of compensation systems. Objective performance is arguably more important than subjective performance to firm outcomes. Furthermore, additional work teasing out the effects of pay ceilings, pay floors, and pay ranges seems important for future work on pay variation.

Causal Inferences in Pay Variation Research

The third assumption addressed in this study was in regard to whether there is a causal relationship between pay variation and individual responses. In regard to performance, discussed at length above, pay range was not found to have a causal relationship with objective performance. This is interesting because the link between pay range and individual performance is an important one to much of the pay variation research (Conroy et al., in press; Downes & Choi, 2014; Gupta et al., 2012). As previously noted, one possible explanation is the artificiality of the laboratory setting. Another related explanation is that the pay manipulations may not have been sufficiently different, such that the narrow range was not small enough to find an effect. Mitra, Gupta, and Jenkins (1997) reported that a just noticeable difference for a raise in pay was around 7 percent. The difference between $6 and $8, the smallest range in this study, is much more than 7 percent. It may be that distinctions in pay must simply meet a threshold of noticeability to affect performance. Finally, it is possible that allocation rules are actually a more important pay policy than pay range for influencing performance outcomes. That is, what matters is how pay is distributed not how *much* pay is distributed. If this is the case, it seems possible that fairness might explain performance responses. Research that simultaneously addressed how motivation and fairness operate in the relationship between allocation rule and performance could address this possibility.

Interestingly, the allocation rule was a more consistent, significant predictor when ability was controlled in the model. The effect of allocation rule was significant across all datasets (i.e., untransformed, transformed, and with outlier removal) when ability was included as a covariate. This has implications for the pay variation literature as there has been discussion that controlling

for ability removes important variance related to the pay variation and performance relationship (Gerhart & Rynes, 2003). Research that has addressed this issue has been conflicting.

In this study, controlling for ability allowed the allocation rule effect to emerge. This finding contrasts Gerhart and Rynes (2003) argument that controlling for ability suppresses a positive pay variation and performance relationship. The difference may be explained by sorting effects (i.e., attraction and retention of employees due to firm policies and practices, Gerhart & Rynes, 2003). That is, firms with pay-for-performance are likely to attract and retain a higher caliber of employee, which is called a sorting effect. This sorting effect has been established in prior work. For example, Shaw and Gupta (2007) reported higher performers were less likely to turn over from firms with highly communicated, performance-based pay variation. Since the study reported here was experimental and at the individual-level, the result is not surprising. That is, there are not sorting effects in this study design as participants were randomly assigned to conditions. Thus, the only effect of the manipulated pay policy would be a motivational effect. By controlling for ability, the motivational effect could be isolated. Much of the research on pay variation and firm performance may be representative of *both* sorting effects and incentive effects. By not allowing for sorting effects, it is expected that the overall pay policy and performance relationship should be smaller than in organizations, though this does not prevent the motivation effect from emerging in the study. This suggests that the small effects in this study may be due to a lack of the sorting opportunities in the experiment. Additional work teasing out these models would be of great value.

Some of the findings presented here do speak to causal effects of pay range. Expectancy theory components were related to pay policies as hypothesized. Ceilings affected pay valences and allocation rules affected P→Pay expectancies. With random assignment to conditions, the

results are supportive of a causal relationship between the policies and expectancy theory mechanisms proposed. Testing the expectancy theory framework was an additional contribution to the individual responses assumption prevalent in pay variation research. Expectancy theory has been applied to pay variation theorizing in multiple papers (e.g., Downes & Choi, 2014; Gupta et al., 2012; Conroy et al., in press), but has not been tested specifically.

Summary and Recommendations

In all, the differences in findings across allocation rules and pay range seem to provide strong evidence that pay range and equity/equality arguments should not be confused. They address different pay policies in organizations and their confounding is inappropriate. I suggest an end to this confusion, a shift to separating the policies and arguments that have become so entwined in this area of research.

An important point raised in this study is that pay variation is most representative of the incentive intensity policy of the firm. This is an issue often raised when the competing hypotheses approach is used to explain the pay variation and performance relationship. That is, pay variation is viewed as a proxy for high incentive intensity and this is hypothesized to be motivational. If this is the logic, why not measure incentive intensity rather than a proxy for incentive intensity? Similarly, why not measure allocation rules if the effects of allocation rules are of interest?

It seems likely that prior work has taken the pay variation approach because pay variation data are available through public sources for certain groups. These data sources may be convenient, but work taking this approach continues to muddy the literature around incentive intensity and allocation rules. Pay variation measures may be representative of an accumulation of individual equity allocation rules over time with the same employees increasingly performing

highly; these measures may also represent a multitude of organizational factors related to pay. Most current models do not fully address these issues theoretically or empirically.

The study presented here does not provide clear evidence of a pay range and individual performance relationship. The causality of high incentive intensity policies that create pay variation and firm performance continues to be unclear. It may be more beneficial to actually ask firms about their pay policies if this is the interest of the researcher. Much of the field work on pay variation is unclear regarding what the pay variation construct actually represents.

Another recommendation is that researchers put an end to the old model of correlating pay variation measures and firm performance to test competing hypotheses that postulate a positive effect of pay variation based on tournament/agency/expectancy arguments versus a negative effect of pay variation based on equity/relative deprivation arguments. Rather, the field of pay research would benefit from a move toward multi-level frameworks.

Pay variation from a multi-level perspective would account for the correct levels of theoretical arguments. For example, in this study, a positive relationship between pay range and individual performance was proposed based on expectancy theory. Extensions of this study could address the relationship between pay range and individual affective responses based on theories more proximal to affective responses than motivation (e.g., justice theories). Both motivational and affective responses may be important to the aggregation of individual-level effects to the group-level and to the firm-level. Simply testing the pay variation and firm performance ignores far too much of the complexity involved in this research area, nuances across levels must be addressed. In sum, studying pay policies (rather than rough measures) and developing multi-level models has the potential to increase the value of strategic compensation research.

Practical Implications

One study alone cannot sufficiently answer the many questions that arise for organizational leaders and managers in the realm of how to allocate resources to the workforce. It is important to keep in mind that in addition to motivation and performance, employees also experience feelings of unfairness and deprivation in response to pay policies and decisions. These feelings may lead to sorting effects, such that good employees leave the firm while poor employees stay (Gerhart & Fang, 2014; Shaw & Gupta, 2007). As such, the practical implications noted here must be considered within a broader context of the pay variation literature.

For organizational leaders designing pay programs, this study provides evidence that pay policies affect the motivational responses of employees. Allocation rules appear to be important to influencing individual performance while pay range effects are unclear. The results of this study give greater support to the idea of making distinctions among employees, but little support is provided regarding the size of these distinctions.

Drawing on the findings related to expectancy theory, it appears that employees have stronger perceptions that pay will be tied to their own performance when equity rules are used than when equality rules are used. A long tradition in expectancy theory research, as well as the results of this study, has shown that these expectancies do influence motivation and performance behaviors (Bamberger & Belogolovsky, 2010; Van Eerde & Thierry, 1996). When employees can see the relationship between their performance and their outcomes, it creates an impetus to perform, assuming the outcomes are valued. This aligns with Shaw's (2014) recommendation that identifiability (i.e., the ability to measure performance) is important to understanding pay variation's effects. When performance can be measured at the individual-level, organizations

may benefit from allocating pay in a way that recognizes individual contributions through rewards.

Valences of outcomes are also influenced by the pay policies. When employees see greater value in the rewards they can earn, they are likely to be more motivated to perform well. In fact, the interaction between P→Pay expectancies and pay valences suggests that it is not simply important to align pay and performance for individuals. Rather, it is important to tie rewards of value to high performance as this increases the strength of the P→Pay relationship with motivation. Together, these findings indicate that pay policies which increase P→Pay expectancies and high effort outcome valences *simultaneously* may have the most profound effects on employee behaviors.

This study also speaks to issues facing supervisors and managers. The clear importance of P→Pay expectancies and pay valences on motivation and performance suggests managers should create environments where employees experience increased P→Pay expectancies and pay valences. One clear way to do this is to measure individual performance and reward such performance. While managers may have less power over the budgets in their firms, they may be able to make allocation decisions that ensure employees have a clear line of sight regarding the performance to pay relationship. When these performance measures and allocation approaches are in place, good communication with employees can also increase employee perceptions of the relationship between pay and performance.

As expected, ability was found to have a relationship with E→P expectancies, which mediated the relationship between ability and motivation. In fact, E→P expectancies were the greatest predictor of motivation in this study. Managers may benefit from creating an environment that increases the E→P expectancies of their individual employees. This may be

accomplished through stronger communication around good performance to increase feelings of self-efficacy (Shamir, House, & Arthur, 1993) or through training and selection practices that ensure highly capable employees.

In sum, the importance of the expectancy components in affecting motivation and performance indicates that perceptions are central to explaining employee motivation. So, it is not simply important that policies create an environment where performance is tied to valued outcomes. It is also important that sufficient communication ensures employees are aware of these policies.

Limitations

Studies must be designed with consideration of the costs and benefits associated with a selected research design. This investigation is no different. A number of limitations note caution in interpreting results and may explain unsupported findings. Here, these limitations are noted. Limitations of one study may suggest future directions for follow-up studies. These potential directions are also addressed.

Generalizability

In order to strengthen internal validity, an experimental design in a laboratory setting was used. The use of a laboratory setting limits the realism of the pay policies and work environment. Individuals in the study were not actual employees; they were not trying to maintain employment or dealing with the host of pressures that are generally experienced in organizations. The focus of this study was almost entirely on pay, such that other important outcomes to individuals, such as group relationships were weak. Individuals did not know other members of their group or have concerns about a long-term working relationship. In organizations, these relationships are likely to be important to the motivational force equation.

For example, acceptance from coworkers may be an important outcome for consideration in the motivational force equation. Research in the field that measures other outcomes and individual differences regarding the value of these outcomes by employees could address this limitation. Prior field research findings in this area have been ambiguous, leading to a need to isolate pay policies in a lab setting and use experimental design to address causality. This study has taken a step in that direction. The knowledge gained from this study can be used to improve future field research on strategic compensation issues. Specifically, as discussed earlier, pay policies may represent a better approach to measuring compensation strategies in future field research rather than simply pay variation.

Another issue is the use of undergraduate students as a sample. It would be reasonable to question the generalizability of this sample to the working population. However, there are a number of reasons why the undergraduate sample may be appropriate. One, undergraduate business majors represent a population of current and future employees in organizational entry-level positions. Two, the pay ranges that could be paid in this study were more likely to be meaningful to an undergraduate than to individuals that are currently employed. If we want to see how individuals react to different pay ranges, there is a need to use meaningful ranges. It is unlikely that a manager would respond to the amounts of pay available in this study; however, undergraduates may view these potential payouts as valuable spending money. In order to test for causality, an experimental approach was valuable, it would be far too expensive to conduct this kind of test with large amounts of money at stake. Since students represent current and future employees at a time in their lives where lower amounts of money may be seen as valuable, this was an ideal sample for an experimental test despite its limitations.

In general, a tradeoff was made in this study between external validity and internal validity, such that internal validity was given priority. This study allowed for causal inference and helped identify problems in pay variation field research. The knowledge from this study can be valuable for future research in field settings. Addressing incentive intensity and allocation policies in actual organizations, rather than using pay variation as a proxy measure, can build on this study's findings and address external validity concerns.

Motivation-related Variance in Performance

Another study limitation is the restricted amount of time that participants were actually engaged in the paid task. This limitation may explain a lack of motivation-related variance in the dependent performance measure. The amount of variance explained in performance by motivation was around 1 to 2 percent for objective performance and 5 percent for subjective performance. Considering that performance is a function of motivation and ability (Campbell, 1990), this is a small amount.

It may be that the performance measured in this study was more reflective of maximum performance than typical performance (Klehe & Anderson, 2007). Maximum performance represents ability more than motivation and occurs when three conditions are met (Klehe & Anderson, 2007; Sackett, Zedeck, & Fogli, 1988). One, individuals are aware they are being evaluated. This was part of the study since evaluation was required in order to distribute payment. Two, the participant accepts the expectation that performance is maximized. This may vary some, and is likely to be the reason that motivation had any relationship with performance. Three, the time duration is short. The five minute intervals in this study were short. This decision was made to ensure that the overall study did not take too long, as this might have lowered participation and engagement in the study. However, future research would benefit

from using tasks that take more time to complete. Overall, a valuable modification to this study design would be to extend the task performance time, so that motivation would be required for a participant to continue performing the task well. This would allow for greater variation in the performance variable and this variance would assist in detecting effects of pay policies.

Group-level Outcomes and Affective Responses

This study was also limited in that it focused entirely on individual-level responses. This was the scope of the study. Yet, we know that some sort of pay variation and performance relationship exists at the firm level based on prior research (Conroy et al., in press; Shaw, 2014). The cross-level nature of pay variation has been explicated in recent work (Conroy et al., in press). The study presented here can be taken as evidence that there is a link between pay policies and motivational mechanisms, but it does not say anything about group-level or firm-level outcomes of these policies.

There may be interesting changes in effects as levels change. For example, the heterogeneity and homogeneity of the motivation mechanisms within a group may influence what occurs at the group-level. Similarly, the interdependence of the group may affect the extent to which individual motivation and performance are actually related to group motivation and performance. This suggests two areas for additional work. One, as noted earlier, is testing the multi-level and cross-level relationships inherent in pay variation research. Conroy et al. (in press) outlined a starting point of propositions for such an endeavor. The other is to vary the level of interdependence of groups to assess how the effects of allocation rules and incentive intensity on both individual-level and group-level outcomes may change across levels of interdependence.

The sorting effects (i.e., retention of certain types of employees) of pay variation policies were also not addressed in this study. Still, these effects are important to consider. Gerhart and Fang (2014) proposed that sorting effects are an important part of the pay-for-performance puzzle. Though it was beyond the scope of this investigation to address sorting effects, the study presented here has identified a potential approach to addressing the sorting issue in the pay variation literature by separating incentive intensity and allocation rules rather than confounding them in one pay variation measure. Incentive intensity may make the pay system more salient to employees and lead them to have stronger positive or negative affective reactions to allocation rules, leading to retention and turnover among employees, respectively. These responses may also differ by the performance level of the employee. Supporting this conjecture, Shaw and Gupta (2007) reported that highly-communicated, performance-based pay variation was related to lower turnover among high performing employees. The sample was truck drivers, arguably an environment dominated by *individual* performance-based pay (i.e., similar to equity allocation rules). Thus, a potential prediction is that high performers will have strengthened reactions to allocation rules as the incentive intensity increases with equity allocation being more desirable and equality allocations being less desirable. Addressing these sorting questions is valuable to the area of pay variation because findings would have implications for firm performance outcomes. The loss of good employees could have serious negative implications for the firm while the loss of poor employees may be desirable.

Conclusion

This investigation identified and tested assumptions of pay variation research. The value of separating equality/equity arguments from pay variation arguments is the primary contribution of this work. Most importantly, this study leads to the recommendation that strategic

compensation research would benefit by moving toward a more policy-based approach to addressing important compensation issues rather than using blunt proxy measures, such as pay variation. Only by continually studying the effects of pay can the academic knowledgebase provide appropriate guidance to practitioners.

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APPENDIX A

Research Compliance Documents

May 7, 2013

MEMORANDUM

TO:	Samantha Conroy Nina Gupta
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	13-04-687
Protocol Title:	*Explaining the Effects of Pay Variation on Individual Outcomes*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 05/07/2013 Expiration Date: 05/06/2014

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 550 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

June 4, 2013

MEMORANDUM

TO:	Samantha Conroy Nina Gupta
FROM:	Ro Windwalker IRB Coordinator
RE:	PROJECT MODIFICATION
IRB Protocol #:	13-04-687
Protocol Title:	*Explaining the Effects of Pay Variation on Individual Outcomes*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 06/04/2013 Expiration Date: 05/06/2014

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 550 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

June 24, 2013

MEMORANDUM

TO:	Samantha Conroy Nina Gupta
FROM:	Ro Windwalker IRB Coordinator
RE:	PROJECT MODIFICATION
IRB Protocol #:	13-04-687
Protocol Title:	*Explaining the Effects of Pay Variation on Individual Outcomes*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 06/24/2013 Expiration Date: 05/06/2014

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 550 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

July 19, 2013

MEMORANDUM

TO:	Samantha Conroy Nina Gupta
FROM:	Ro Windwalker IRB Coordinator
RE:	PROJECT MODIFICATION
IRB Protocol #:	13-04-687
Protocol Title:	*Explaining the Effects of Pay Variation on Individual Outcomes*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 07/19/2013 Expiration Date: 05/06/2014

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 550 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

February 6, 2014

MEMORANDUM

TO:	Samantha Conroy Nina Gupta
FROM:	Ro Windwalker IRB Coordinator
RE:	PROJECT MODIFICATION
IRB Protocol #:	13-04-687
Protocol Title:	*Explaining the Effects of Pay Variation on Individual Outcomes*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 02/06/2014 Expiration Date: 05/06/2014

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 613 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

INFORMED CONSENT

DATE: _____

PROJECT TITLE: Financial services task
INVESTIGATORS: Samantha Conroy, Nina Gupta

RESEARCH PURPOSE AND DESCRIPTION OF PROCEDURES: The purpose of this research is to study performance on a financial services task. You will watch a training video that teaches you how to perform a financial services task. Then, you will have the chance to practice the task. Finally, you will perform the task over two different sessions. Throughout the study, you will also be completing a number of surveys. You will receive course extra credit for completing this study. You also have an opportunity to earn money by working on the task in this study.

TIME COMMITMENT INVOLVED: About 100 to 120 minutes

RISKS AND CONFIDENTIALITY: No risk is anticipated in this study. In addition, your responses will be kept confidential to the extent allowed by law and University policy. Data from the experiment will be saved into an electronic format that is identifiable only by number. GPA and SAT/ACT score data will be matched to participant ID numbers using student ID numbers. Student ID numbers will then be deleted and only participant ID numbers will remain in the electronic data.

BENEFITS: Increased understanding of the academic research process.

CONSENT
I have been fully informed of the above-described procedure with its possible benefits and risks. I understand that my responses will be kept confidential to the extent allowed by law and University policy. *I voluntarily give permission for my participation in this study.* I know that the investigator and his/her associates will be available to answer any questions I may have. If, at any time, I feel my questions have not been adequately answered, I may request to speak with the primary investigator, Samantha Conroy, at 479-575-6105. If I have any questions about my rights as a research participant, I can contact the University's Compliance Coordinator, Ro Windwalker, at 479-575-2208.

We need your GPA and SAT/ACT score to help us with the statistical analysis of the data. Your information will be kept confidential to the extent allowed by law and University policy.

☐ I give the researchers permission to obtain my GPA and SAT/ACT score from my student records.
☐ I do NOT give the researchers permission to obtain my GPA and SAT/ACT score from my student records.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary and you may choose not to participate without any negative consequences. You may also choose to stop at any time during your participation.

_____

Student ID Number

_____

Name (Printed)

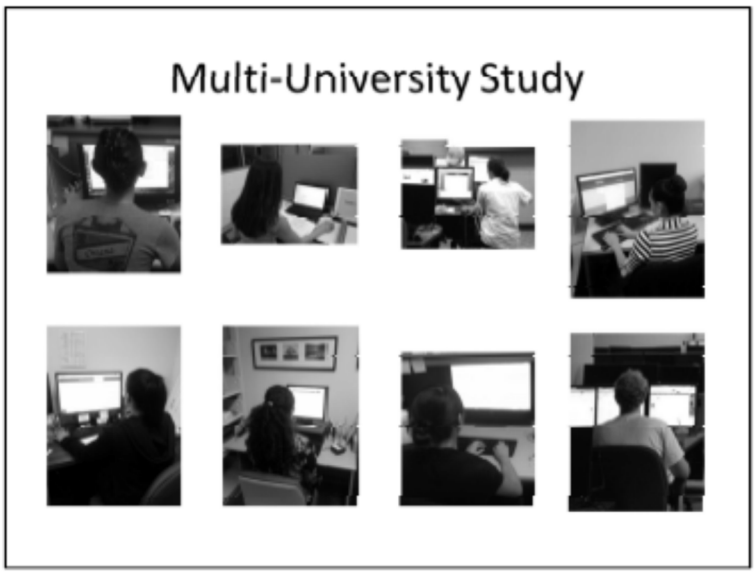
_____ _____

Signature Date

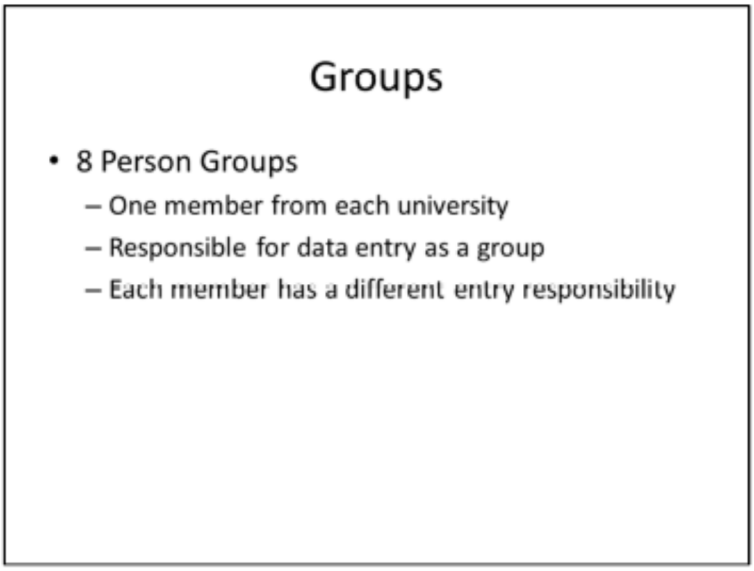
APPENDIX B

Training Video Slides and Script

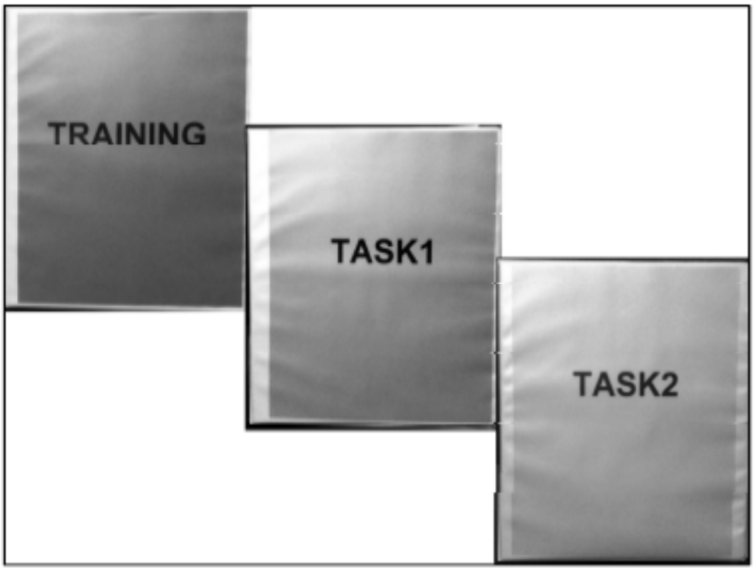
Thank you for participating in our study.
Today you will work with a group to complete a mortgage data entry task.



This is a multi-university study, and members of your group are at other universities.
There are many people simultaneously working on the task at universities across the United States.



Individuals participating in the study will be organized into groups of 8 to enter information from paper applications into an electronic database. You and other members of your group will be able to work together to complete the task through an electronic system.
There are 8 group members because there are eight fields to be entered per application. Each member of your group will be responsible for entering a different piece of information.
Your group's participation in the task will help us assess data entry effectiveness when there are multiple people working together in different locations. I will now explain how to complete the task.



There are three binders at your work station – a blue binder marked training, a green binder marked TASK1, and a yellow binder marked TASK2.

MORTGAGE APPLICATION

APPLICANT INFORMATION – APPLICANT # 3388

Name: Rosalee Kahl

City: Springfield

State: Illinois (IL) ZIP Code: 62701

LOANS, DEBTS, OR OBLIGATIONS

Monthly Payments: $1397.32

Total Liabilities: $54543

INCOME AND ASSETS

Income: $48482

Cash: $11350

Investments: $35518

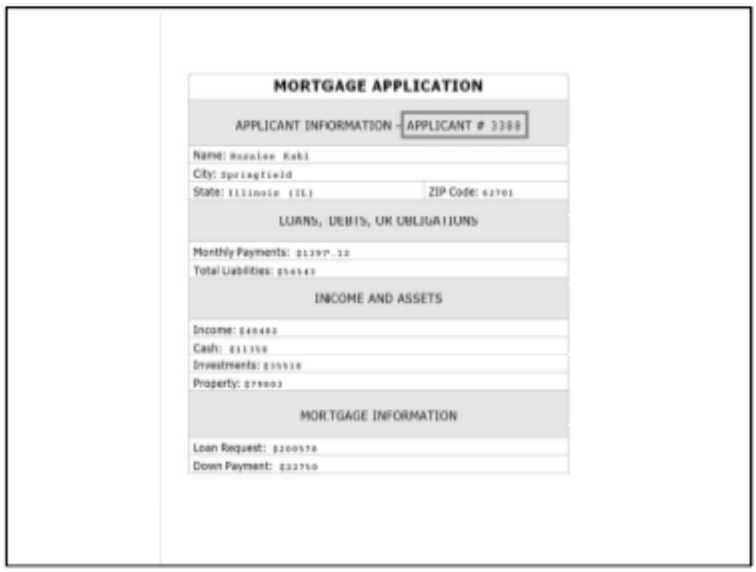
Property: $79003

MORTGAGE INFORMATION

Loan Request: $200578

Down Payment: $22750

Inside the binders you will see mortgage applications.
These documents were developed to look like actual loan applications, so that we can determine how well this multi-location data entry system works.
These documents contain pieces of information that will be entered into an electronic database by your group.



MORTGAGE APPLICATION

APPLICANT INFORMATION – APPLICANT # 3388

Name: Rosalee Kahl

City: Springfield

State: Illinois (IL) ZIP Code: 62701

LOANS, DEBTS, OR OBLIGATIONS

Monthly Payments: $1397.32

Total Liabilities: $54543

INCOME AND ASSETS

Income: $48482

Cash: $11350

Investments: $35518

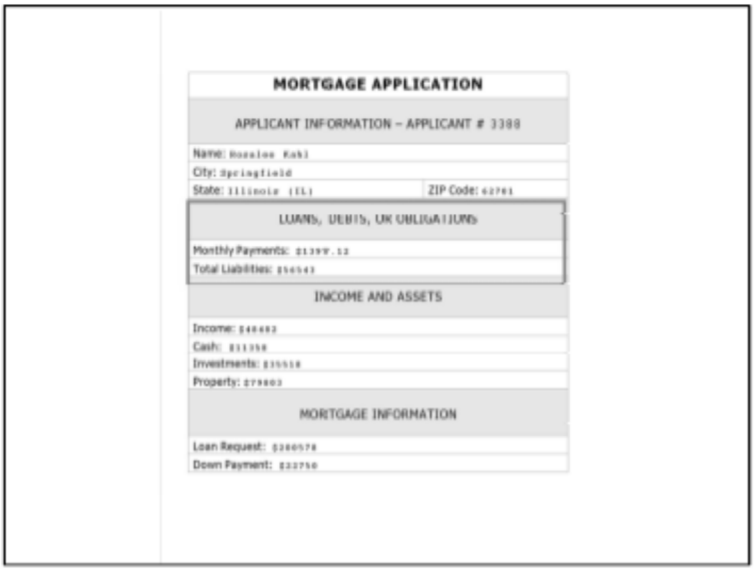
Property: $79003

MORTGAGE INFORMATION

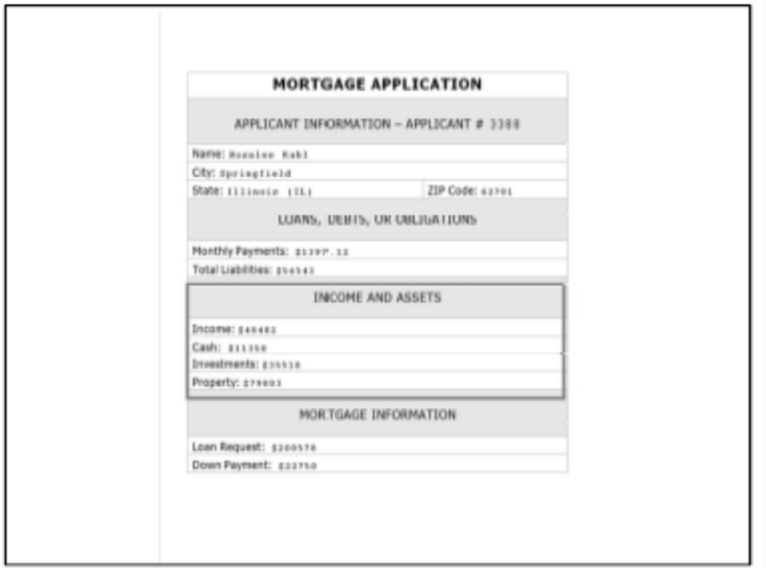
Loan Request: $200578

Down Payment: $22750

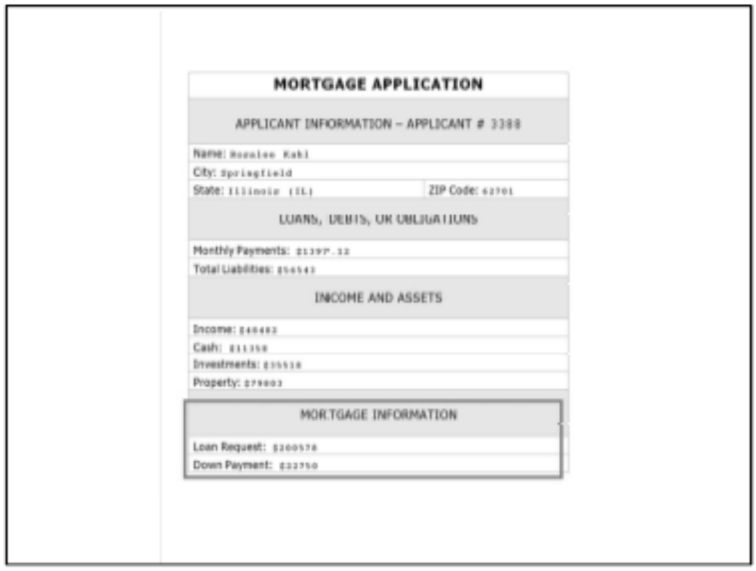
The applicant ID on the mortgage application will be important for matching the paper forms to the electronic forms.



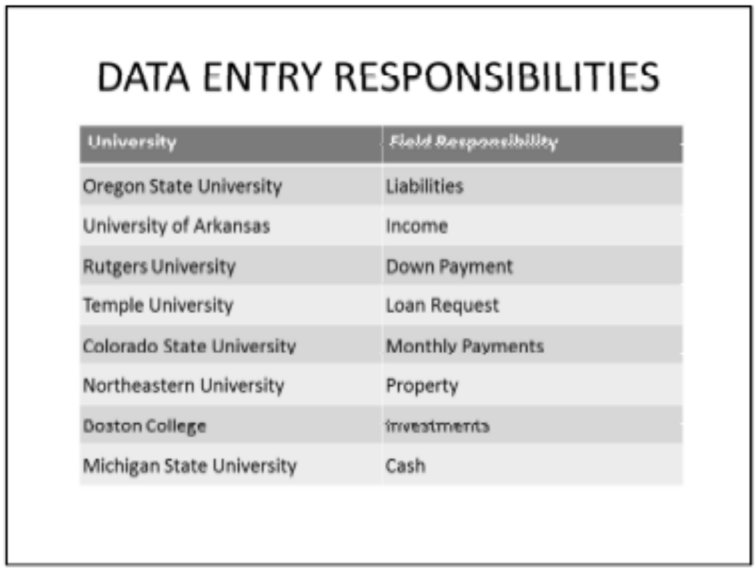
The information that your group will enter includes:
Monthly payments and total liabilities…



…Income, Cash, Investments and Property….

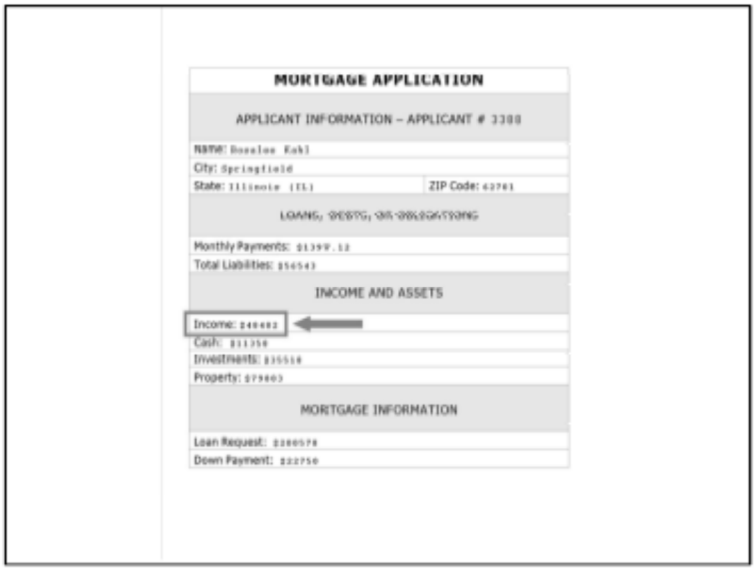


…Loan Request and Down Payment…

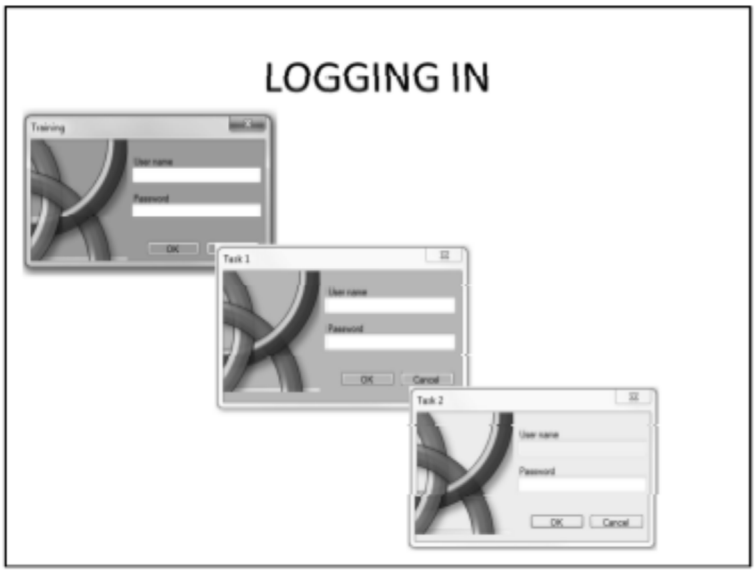


Of these entries, each group member has a different value that he or she is responsible for entering.

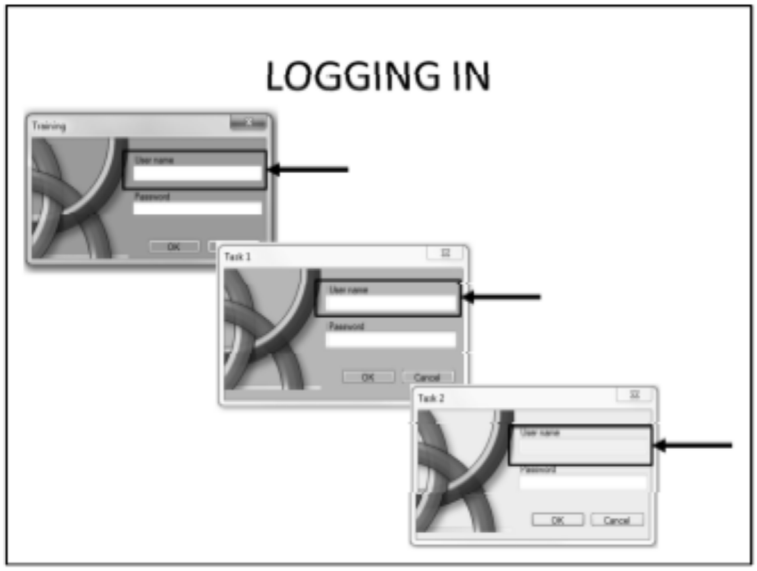
Look for your university in this table. In the same row, you will see the field that you are responsible for entering.



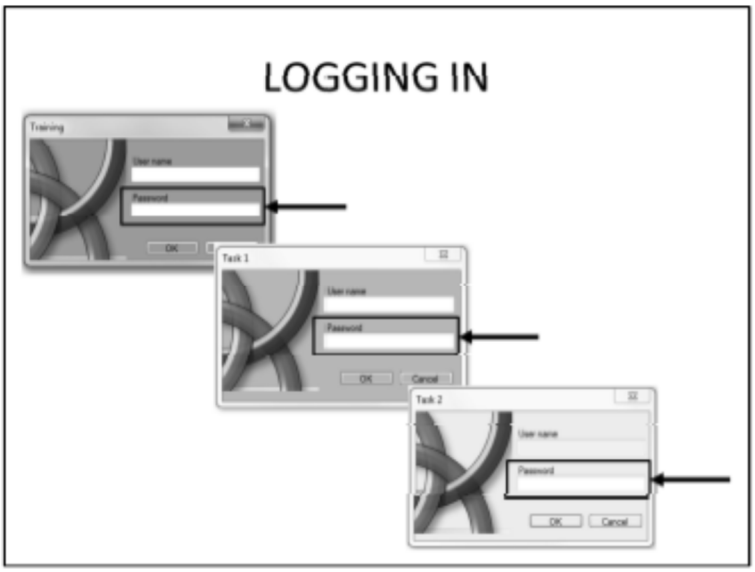
You are at the University of Arkansas, so you will be responsible for entering income



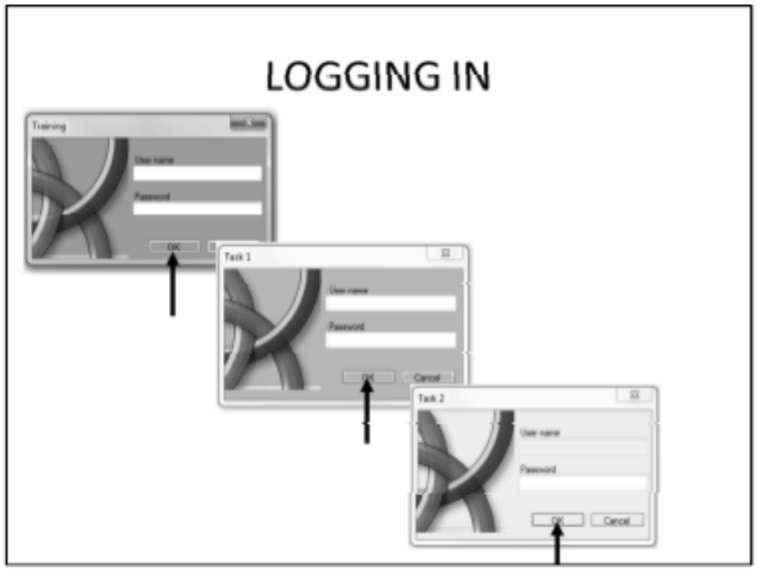
To begin the task, you will first login.
Each login screen is color-coded to match the binder used for data entry.



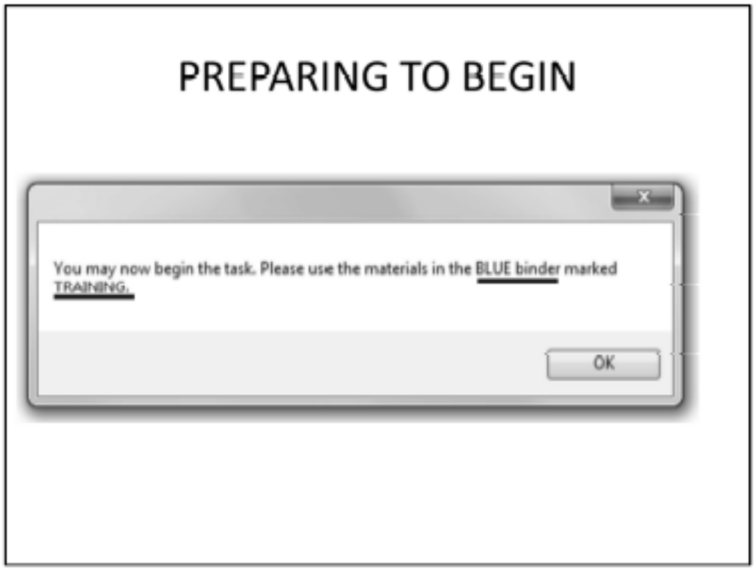
Your username is your four digit participant ID number given to you on an index card when you arrived for the study.



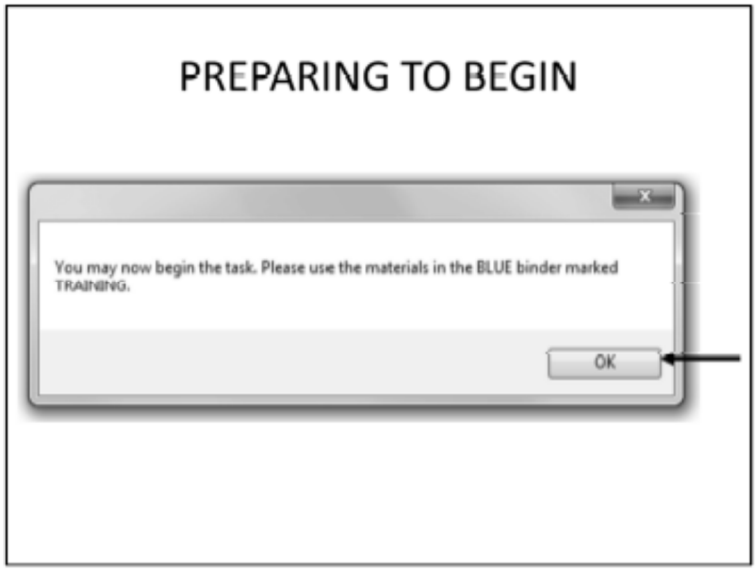
Your password will be provided to you electronically when it is time to begin the task.



Enter your participant ID and password, then click ok.
If you made a mistake, click cancel and enter the information again.



The program will tell you when it is time to begin and remind you of the appropriate binder to use.



You should click ok as soon as you have your materials ready.

You will then see an entry form.

Different group members will be making entries for different fields and will see the forms in different orders.

As a reminder, participants at the University of Arkansas, enter income. That means once you have entered income, you can move on to the next form.

To enter the data, start by checking the applicant ID number on the electronic form and matching it to the paper application.

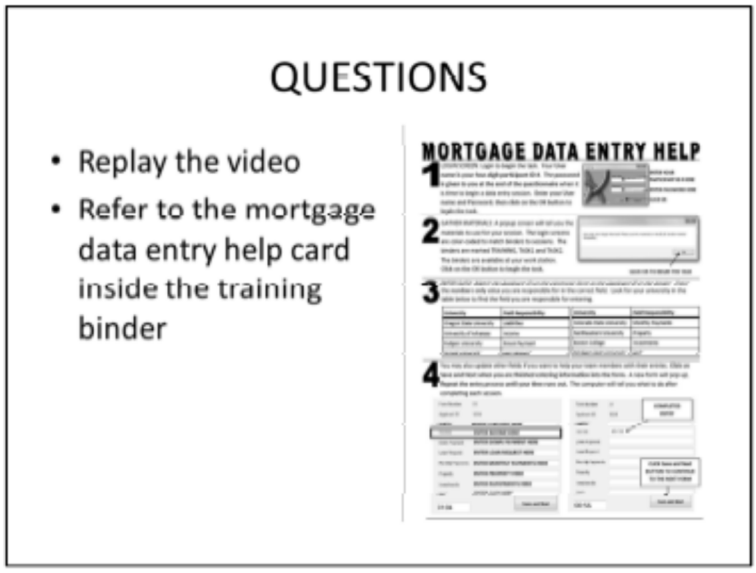
PLEASE NOTE: The paper applications are in numerical order from lowest to highest inside the binder; however, the electronic forms are likely to show up in a different order. So it is important that you always match the applicant ID on the electronic form to the applicant ID on the paper form before you enter a value.

Once you have matched the ID, enter the value for income from the paper form into the field on the electronic form.

You should enter only numbers; the program will not accept any other characters, such as dollar signs, letters or slashes.

When you are completing the task with your group, you will notice that various other fields will have entries. This is because other group members are simultaneously entering information.
You may edit the other fields if you feel like helping your group members. But your main job is to enter the information in your assigned field.
When you are finished with a form click “Save and Next,” and a new form will appear.
Please note once you click “Save and Next,” you cannot go back to make changes to the form.
Repeat the steps for each new form.

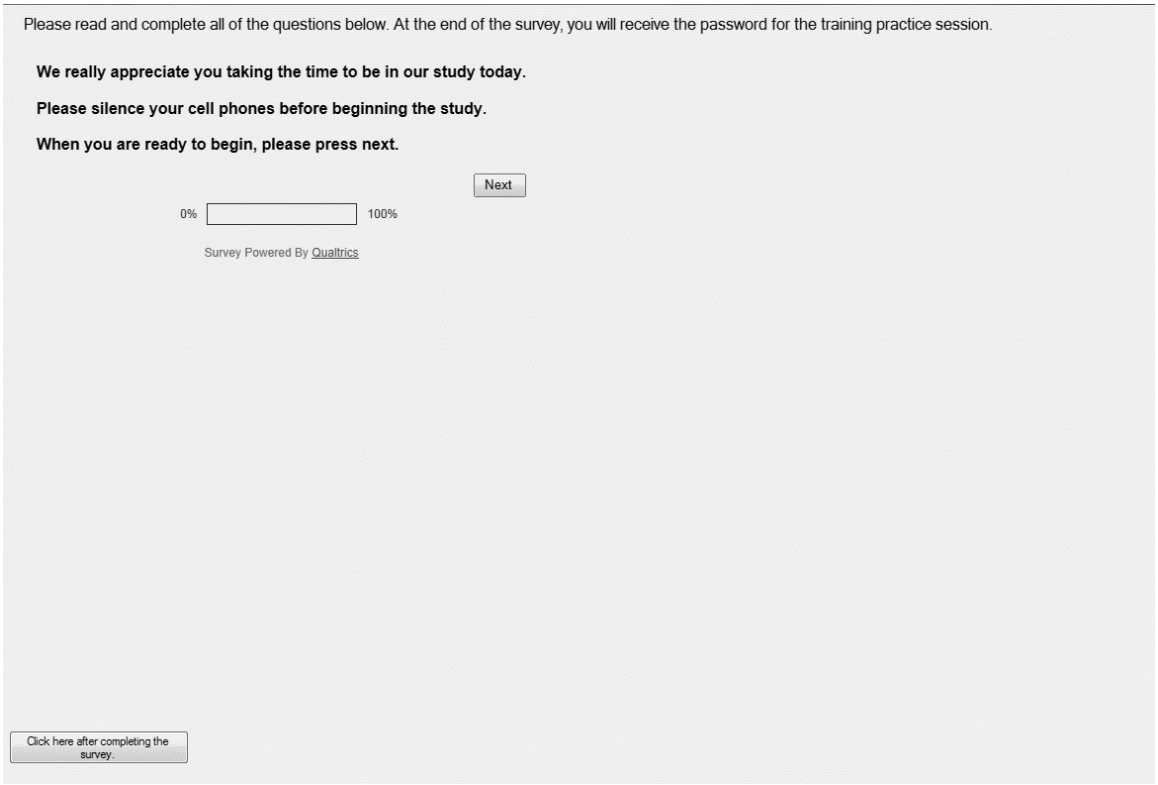
You will have a limited amount of time for data entry.
For the training practice session, you will have 2 minutes. For the TASK1 session, you will have 5 minutes. For the TASK2 session, you will have 5 minutes.
Time is tracked on a timer as you work on the task.
When the timer reaches zero, the entry session is complete.



If you have questions about entering information on forms, you may replay this video before moving forward. You can also refer to the mortgage data entry help card inside the training binder at any time during the study. When you are comfortable that you are ready to practice the task, you should click next. During the practice session, you will practice the task alone.
But you will begin working with a group for the TASK1 session. And you will continue working with the same group for the TASK2 session.
Thank you for viewing this instructional video.

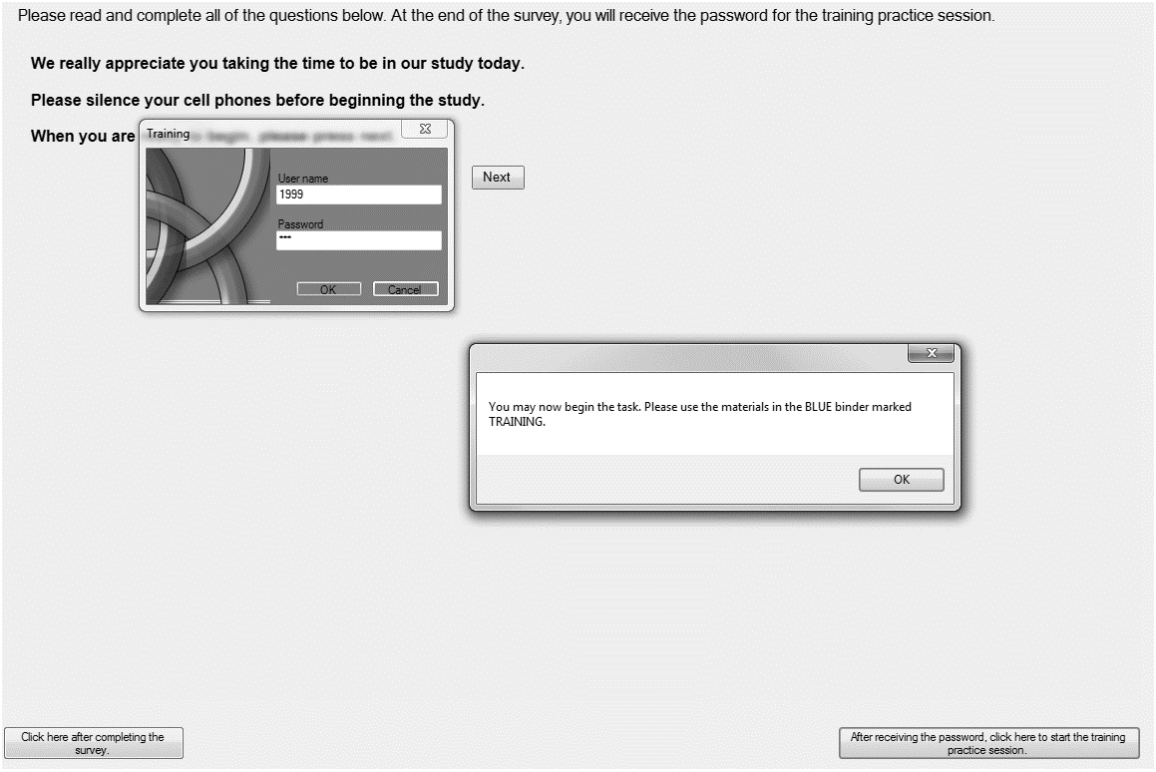
APPENDIX C
Task Programming Screens

PROGRAM SCREEN 1:

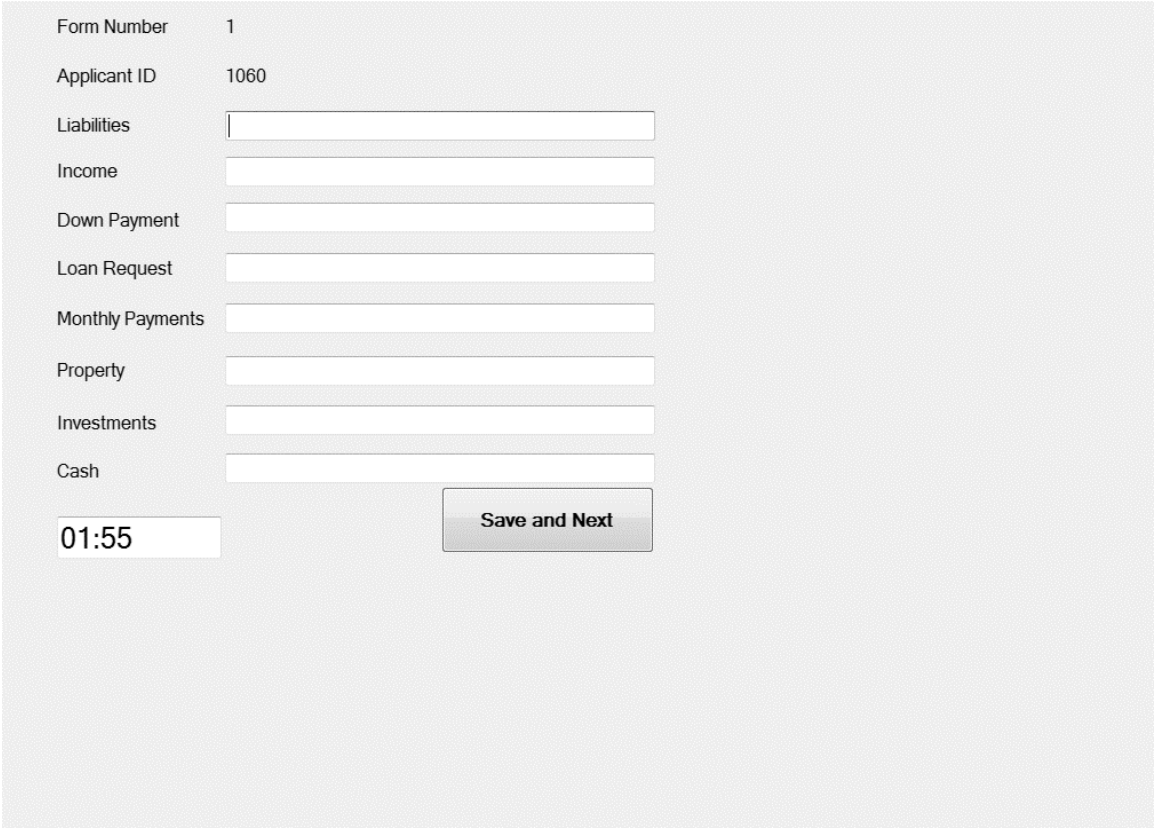


PROGRAM SCREEN 2:

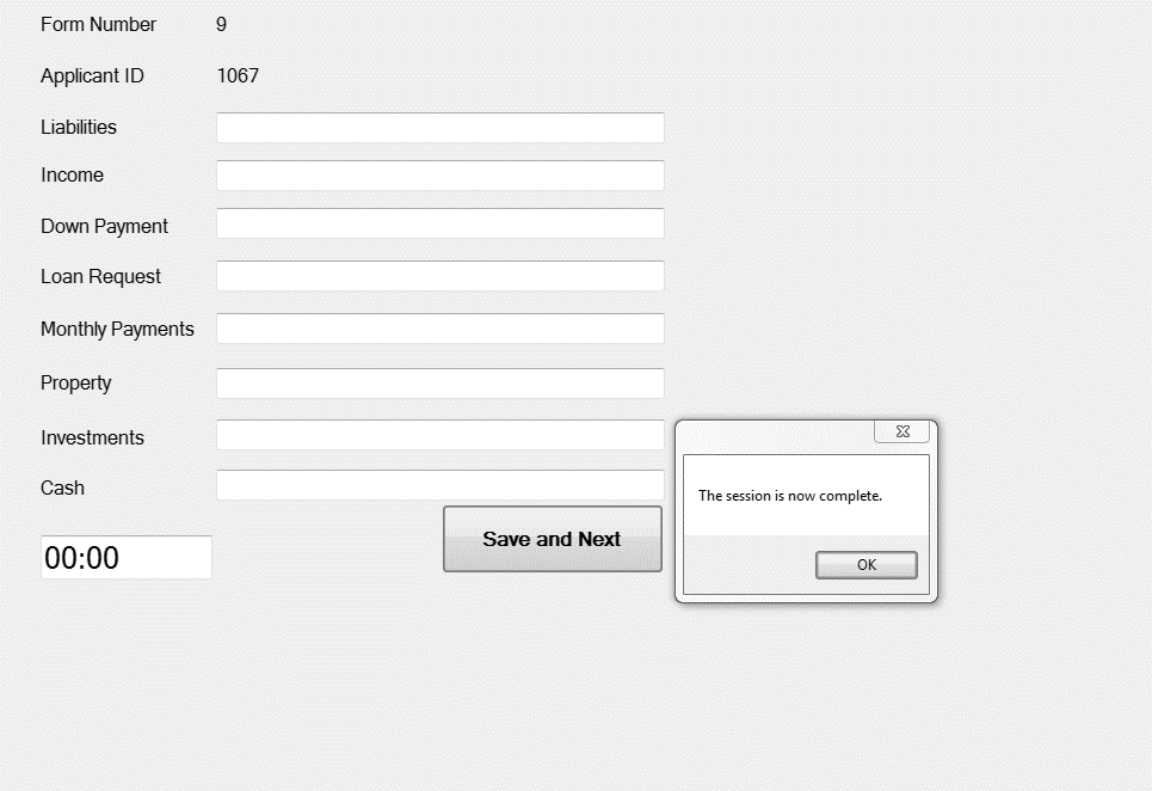
PROGRAM SCREEN 3:



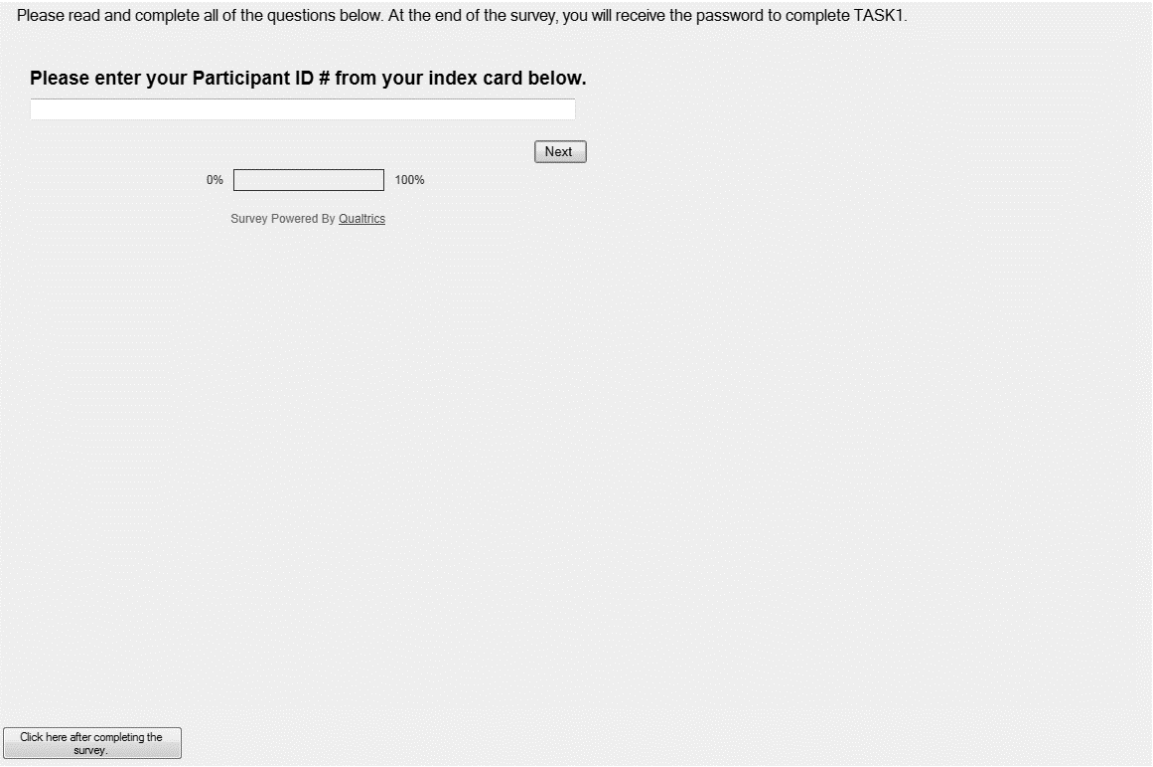
PROGRAM SCREEN 4:



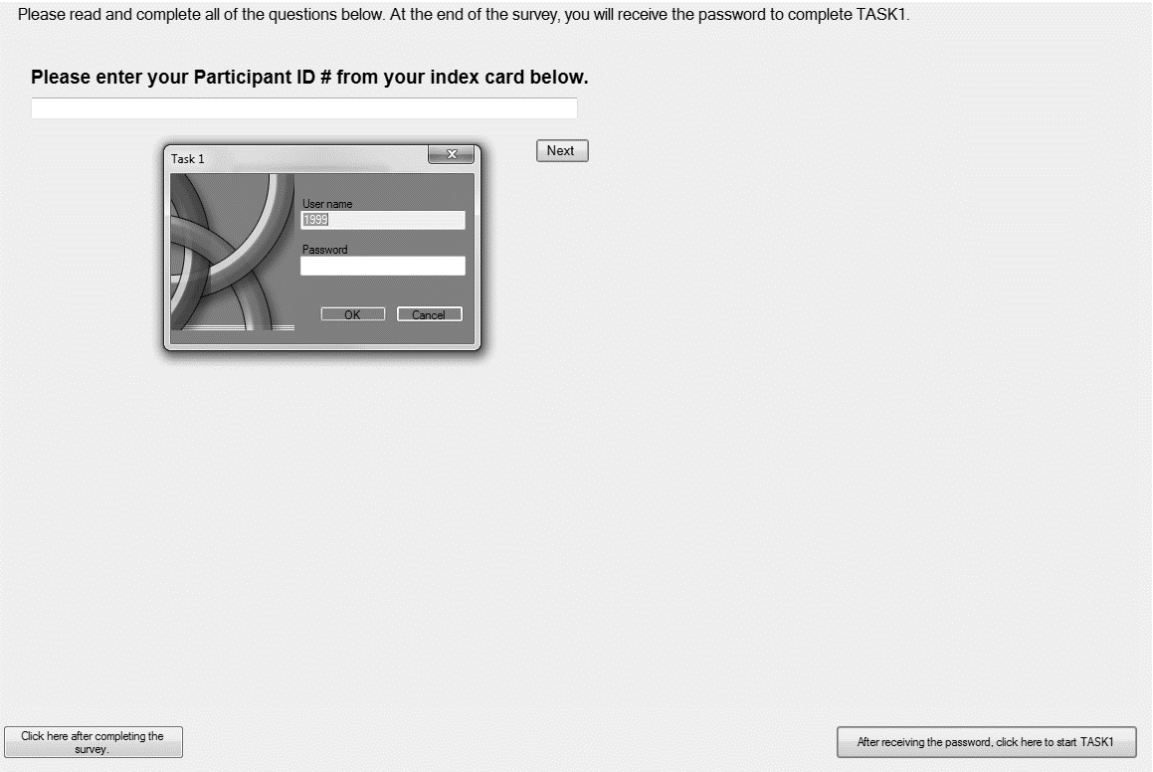
PROGRAM SCREEN 5:



PROGRAM SCREEN 6:



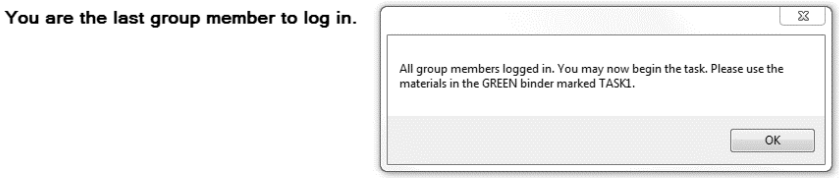
PROGRAM SCREEN 7:



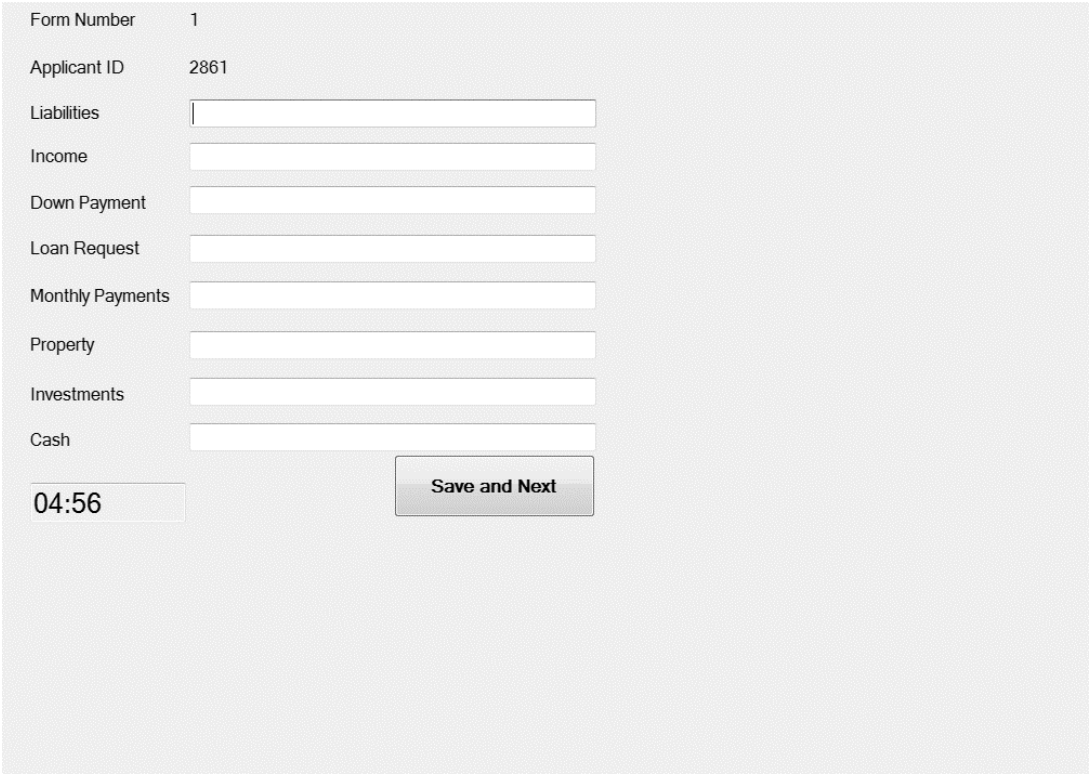
PROGRAM SCREEN 8:

Please wait while we log you in.

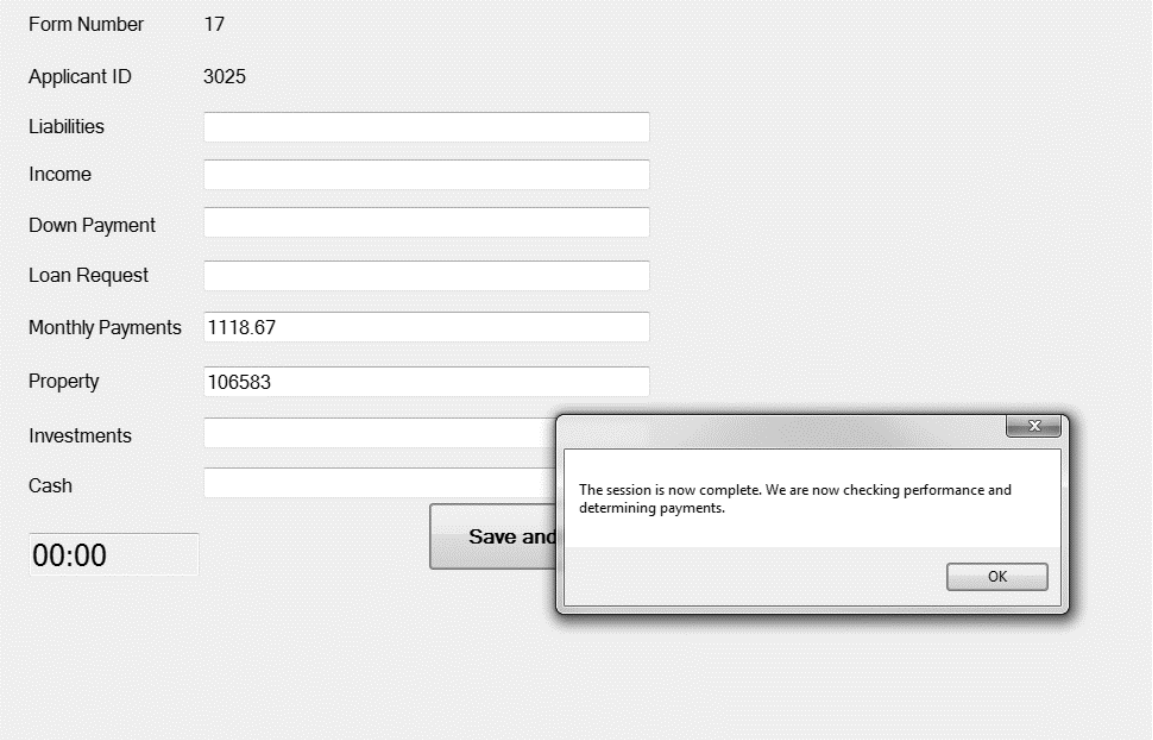
PROGRAM SCREEN 9:



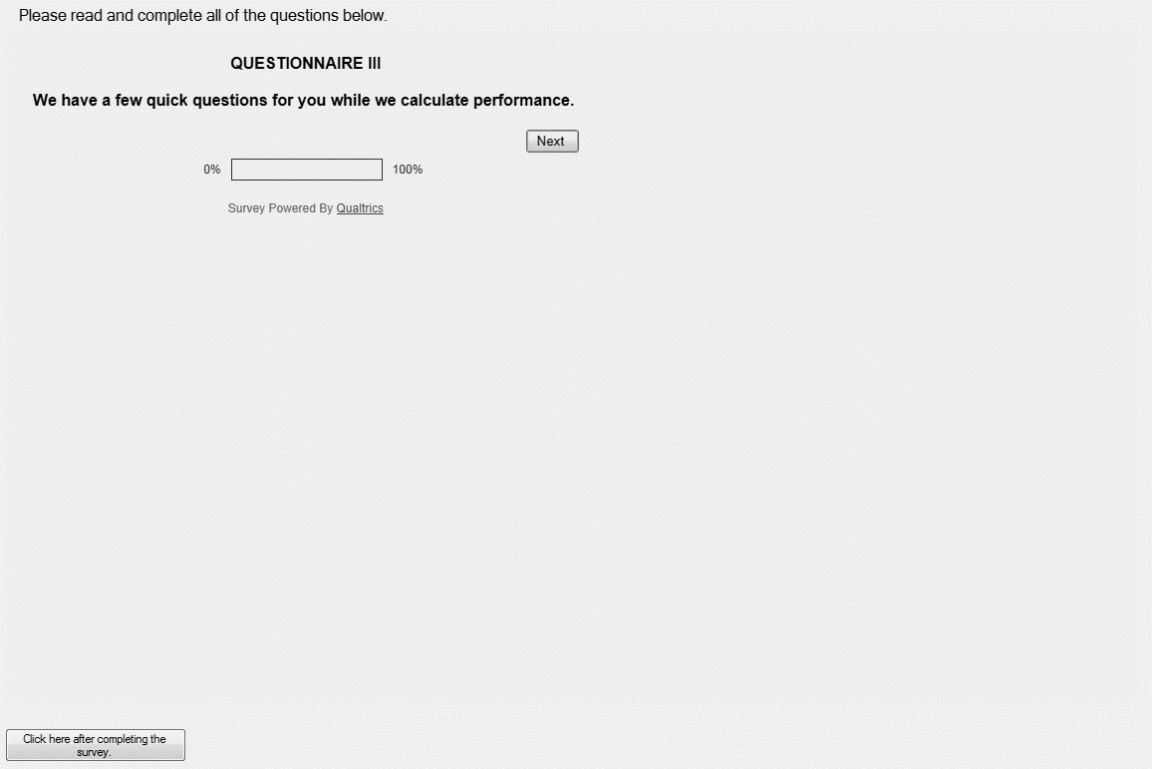
PROGRAM SCREEN 10:



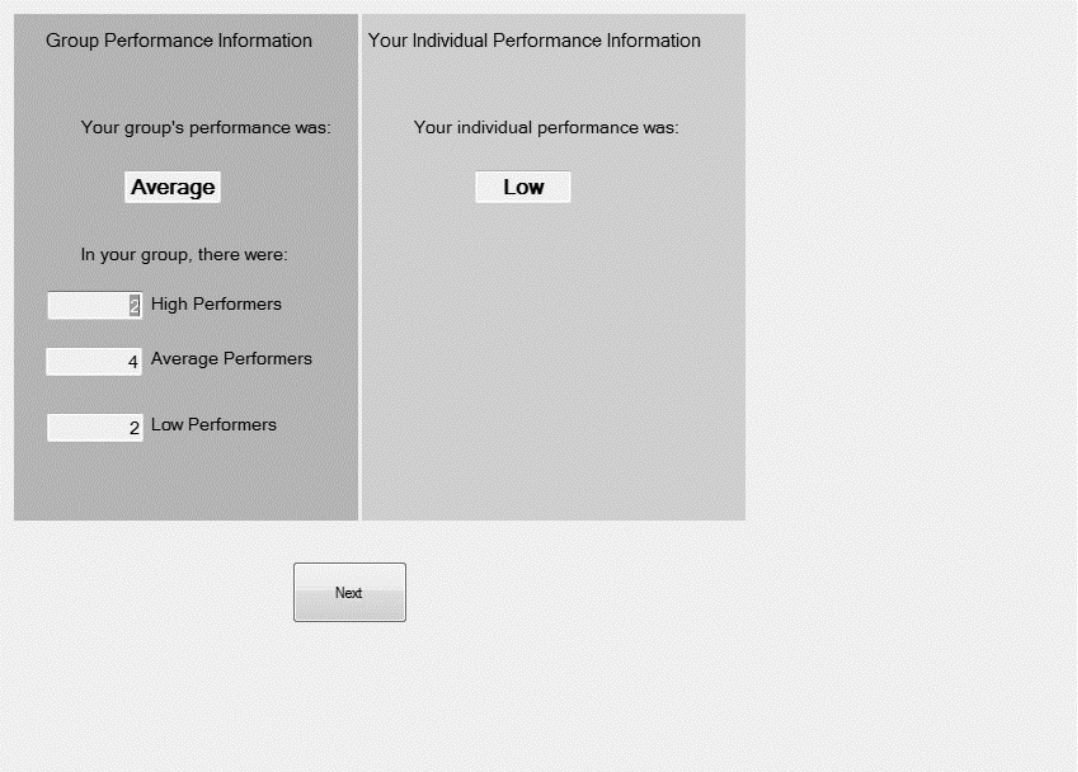
PROGRAM SCREEN 11:



PROGRAM SCREEN 12:

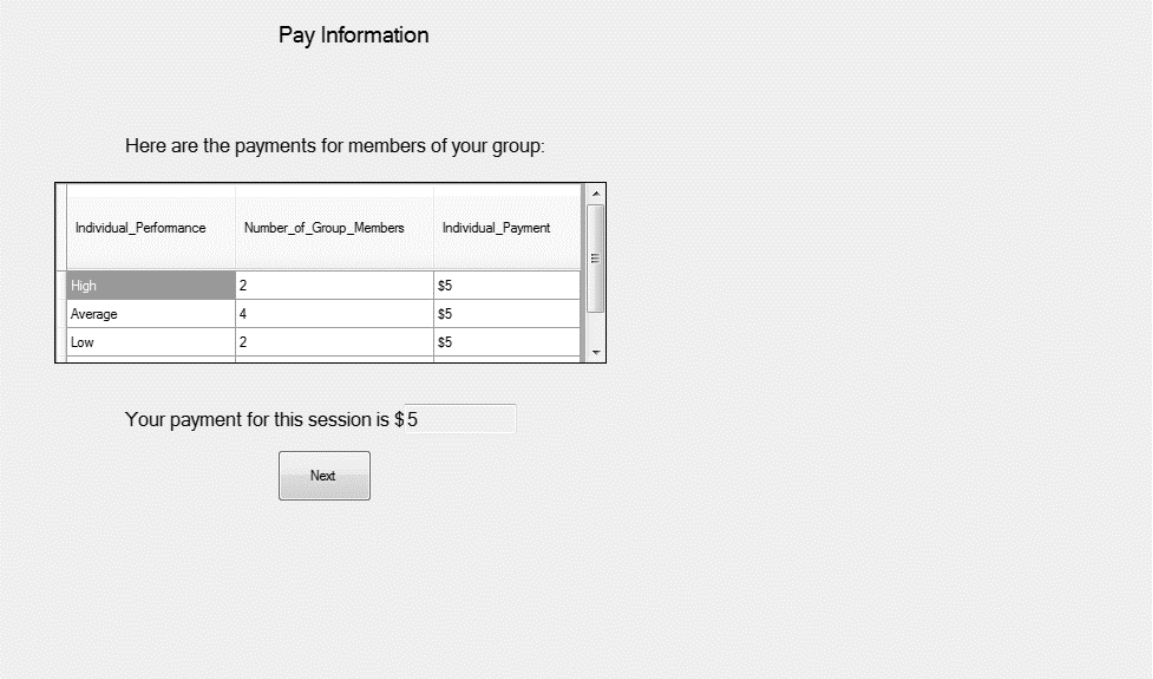


PROGRAM SCREEN 13:



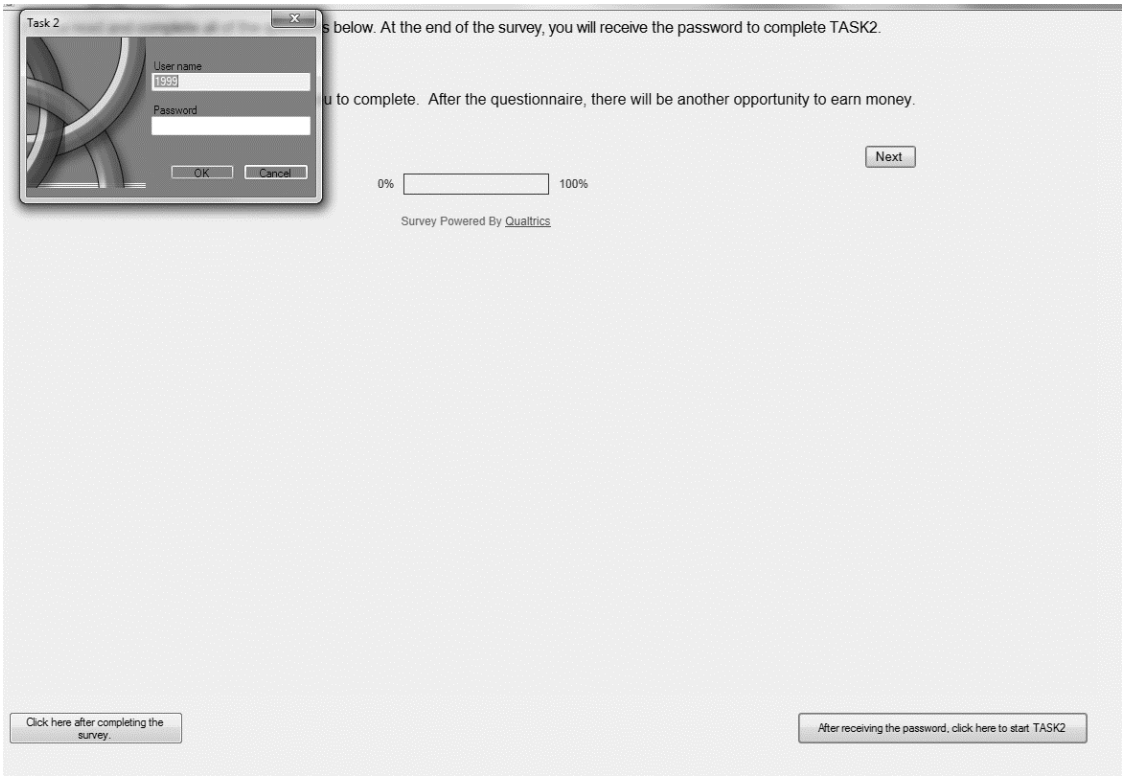
PROGRAM SCREEN 14:

PROGRAM SCREEN 15:



PROGRAM SCREEN 16:

PROGRAM SCREEN 17:



PROGRAM SCREEN 18:

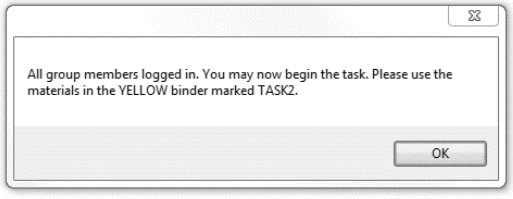
Please wait while we log you in.

PROGRAM SCREEN 19:

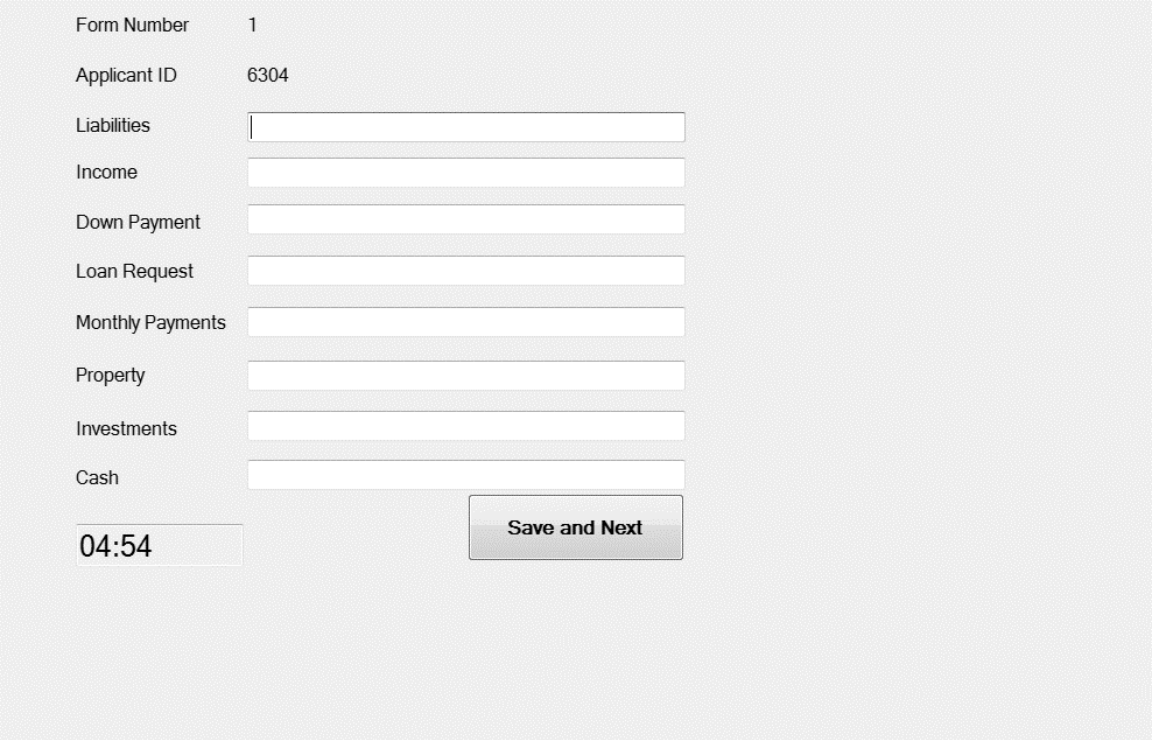
We are waiting for other group members to join.

PROGRAM SCREEN 20:

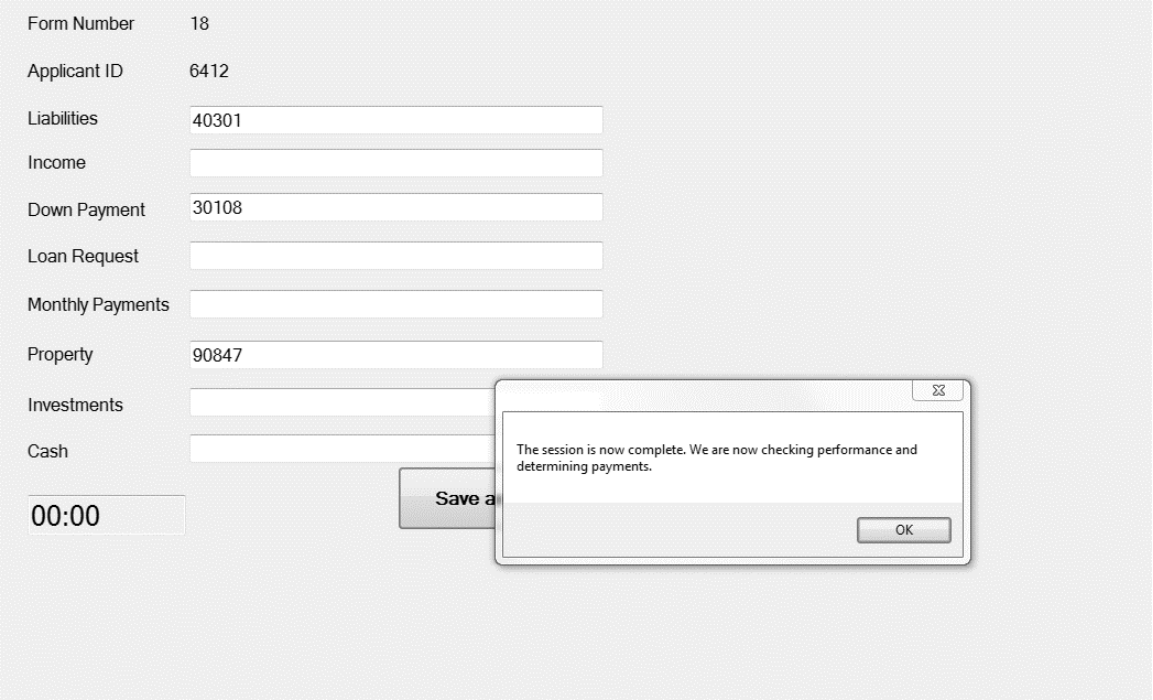
We are waiting for other group members to join.



PROGRAM SCREEN 21:

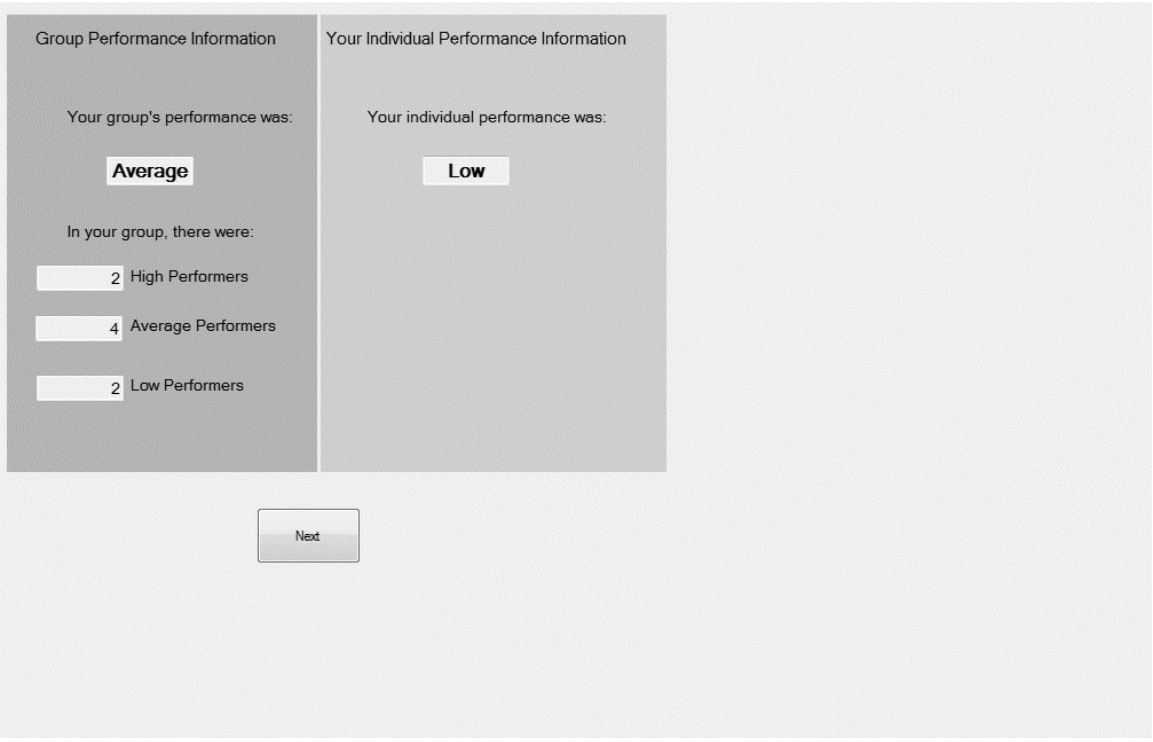


PROGRAM SCREEN 22:

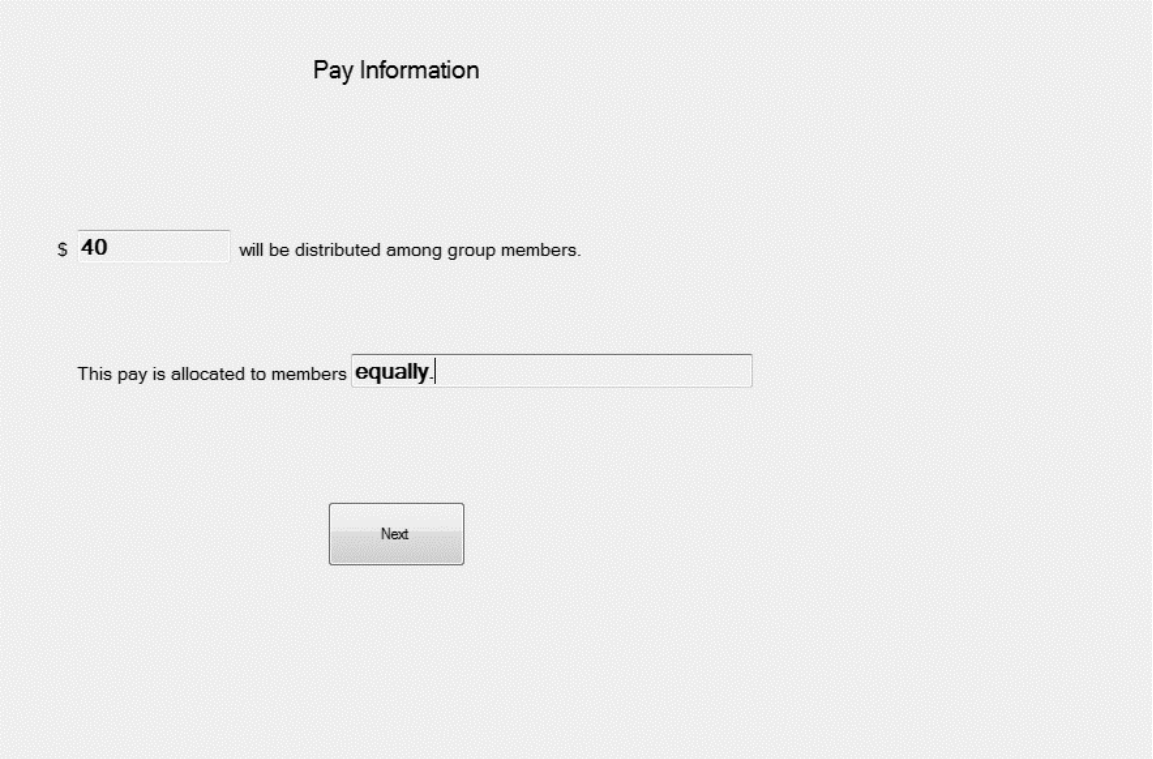


PROGRAM SCREEN 23:

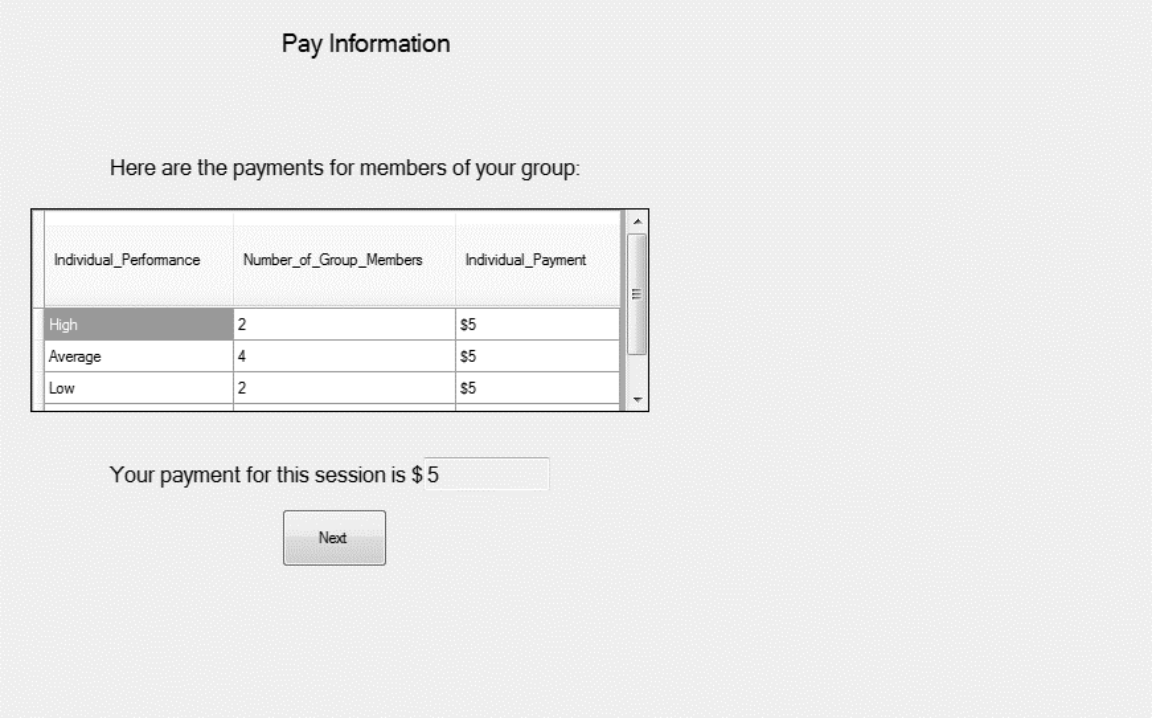
PROGRAM SCREEN 24:



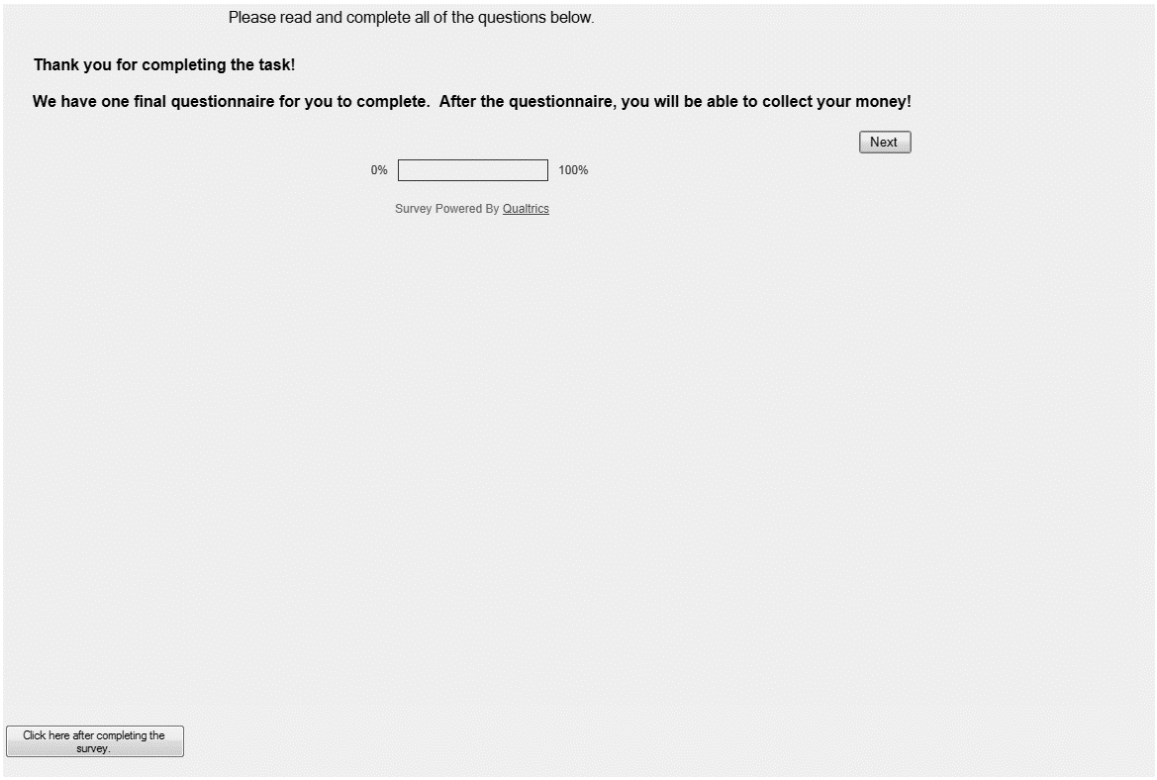
PROGRAM SCREEN 25:



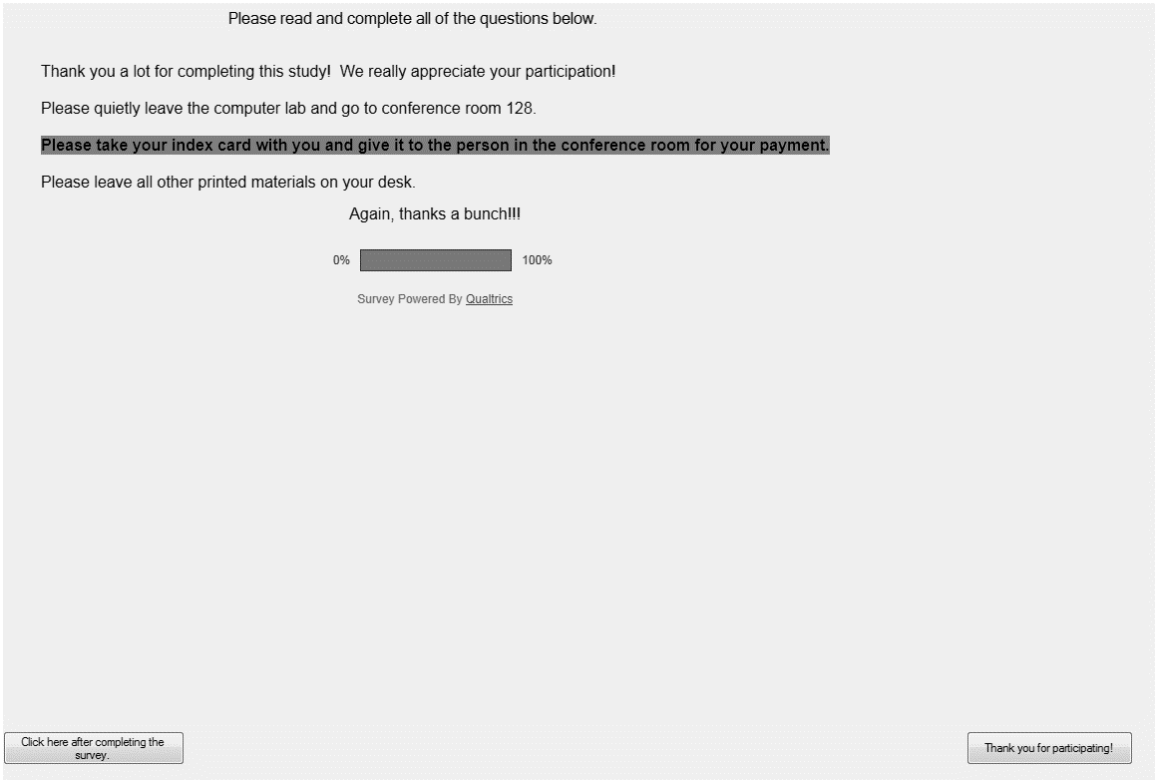
PROGRAM SCREEN 26:



PROGRAM SCREEN 27:



PROGRAM SCREEN 28:



APPENDIX D
Questionnaire Codebook

Abbreviation	Construct	Scale Source
A	Agreeableness	Goldberg, 1999
ACO	Achievement Orientation	Jackson, 1984
AFO	Affiliation Orientation	Jackson, 1984
ANG	Anger	Izard, 1971; Shaver, Schwartz, Kirson, & O'Connor, 1987
APAP	Achievement Performance Approach Motivation Trait	Elliot & McGregor, 2001
APAV	Achievement Performance Avoidance Motivation Trait	Elliot & McGregor, 2001
C	Conscientiousness	Goldberg, 1999
CA	Cognitive Ability	NA
CV	Ceiling Pay Valence	NA
DJ	Distributive Justice	Colquitt, 2001
E	Extraversion	Goldberg, 1999
EFT	Effort	NA
EP	E→P Expectancy for Task Performance	Adapted from the full study described in Djurdjevic (2013)
ES	Emotional Stability	Goldberg, 1999
FG	Feeling of being in a Group	NA
FR	Fear	Izard, 1971; Shaver et al., 1987
FT	Fairness	Folger & Cropanzano, 2001; Nicklin, Greenbaum, McNall, Folger, & Williams, 2011
FTC	Fairness Counterfactual	Folger & Cropanzano, 2001; Nicklin et al., 2011
FV	Floor Valence	NA
GL	Group Liking	Henry, Arrow, & Carini, 1999
GLT	Guilt	Izard, 1971; Shaver et al., 1987
HOP	Hope	Izard, 1971; Shaver et al., 1987
HPP	Happiness	Izard, 1971; Shaver et al., 1987
I	Intellect or Imagination	Goldberg, 1999
IC	Interest in Continuing	NA
IJ	Informational Justice	Colquitt, 2001
MCAR	Manipulation Check Allocation Rule	NA
MCC	Manipulation Check Ceiling	NA

Abbreviation	Construct	Scale Source
MCF	Manipulation Check Floor	NA
MCR	Manipulation Check Range	NA
MOT	Motivation	NA
NA	Negative Affect	Watson, Clark, & Tellegen, 1988
OJSS	Observer Justice Sensitivity	Schmitt, Gollwitzer, Maes, & Arbach, 2005
PA	Positive Affect	Watson et al., 1988
PJ	Procedural Justice	Colquitt, 2001
POI	P→O Expectancy Intrinsic	Adapted from the full study described in Djurdjevic (2013)
POM	P→Pay Expectancy, Money	Adapted from the full study described in Djurdjevic (2013)
PSA	Pay Satisfaction Administration	Heneman & Schwab, 1985
PSL	Pay Satisfaction Level	Heneman & Schwab, 1985
PSS	Pay Satisfaction Structure	Heneman & Schwab, 1985
RLF	Relief	Izard, 1971; Shaver et al., 1987
SD	Social Desirability	short form, Crowne & Marlow, 1960; Reynolds, 1982
SDN	Sadness	Izard, 1971; Shaver et al., 1987
SGP	Subjective Group Performance	NA
SIP	Subjective Individual Performance	NA
SVI	State Valence Intrinsic	Adapted from the full study described in Djurdjevic (2013)
SVM	State Valence Money	Adapted from the full study described in Djurdjevic (2013)
TVI	Trait Valence Intrinsic	Adapted from the full study described in Djurdjevic (2013)
TVM	Trait Valence Money	Adapted from the full study described in Djurdjevic (2013)
VJSS	Victim Justice Sensitivity	Schmitt et al., 2005
-R-	Reverse Coded	

Note. NA indicates scale used was not an established scale; for repeat scales: 1=TASK1, 2=TASK2.

QUESTIONNAIRE I

We would like to ask you some questions about yourself. Please answer these questions as candidly as you can. Remember that your answers are completely confidential. No one outside the project staff will ever know your answers.

1. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI1_a	ACO	a.	Purposeful	[1]	[2]	[3]	[4]	[5]
QI1_b	ACO	b.	Achieving	[1]	[2]	[3]	[4]	[5]
QI1_c	AFO	c.	Loyal	[1]	[2]	[3]	[4]	[5]
QI1_d	ACO	d.	Enterprising	[1]	[2]	[3]	[4]	[5]
QI1_e	AFO	e.	Good-willed	[1]	[2]	[3]	[4]	[5]
QI1_f	ACO	f.	Capable	[1]	[2]	[3]	[4]	[5]
QI1_g	ACO	g.	Resourceful	[1]	[2]	[3]	[4]	[5]
QI1_h	ACO	h.	Attaining	[1]	[2]	[3]	[4]	[5]

2. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI2_a	AFO	a.	Connected	[1]	[2]	[3]	[4]	[5]
QI2_b	ACO	b.	Industrious	[1]	[2]	[3]	[4]	[5]
QI2_c	AFO	c.	Pleasant	[1]	[2]	[3]	[4]	[5]
QI2_d	AFO	d.	Good-natured	[1]	[2]	[3]	[4]	[5]
QI2_e	AFO	e.	Companionable	[1]	[2]	[3]	[4]	[5]
QI2_f	ACO	f.	Aspiring	[1]	[2]	[3]	[4]	[5]
QI2_g	AFO	g.	Kind	[1]	[2]	[3]	[4]	[5]

3. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI3_a	AFO	a.	Warm	[1]	[2]	[3]	[4]	[5]
QI3_b	AFO	b.	Neighborly	[1]	[2]	[3]	[4]	[5]
QI3_c	AFO	c.	Cooperative	[1]	[2]	[3]	[4]	[5]
QI3_d	ACO	d.	Driven	[1]	[2]	[3]	[4]	[5]
QI3_e	ACO	e.	Accomplishing	[1]	[2]	[3]	[4]	[5]
QI3_f	ACO	f.	Ambitious	[1]	[2]	[3]	[4]	[5]
QI3_g	ACO	g.	Competitive	[1]	[2]	[3]	[4]	[5]
QI3_h	ACO	h.	Striving	[1]	[2]	[3]	[4]	[5]

4. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI4_a	AFO	a.	Diplomatic	[1]	[2]	[3]	[4]	[5]
QI4_b	AFO	b.	Friendly	[1]	[2]	[3]	[4]	[5]
QI4_c	AFO	c.	Sociable	[1]	[2]	[3]	[4]	[5]
QI4_d	ACO	d.	Productive	[1]	[2]	[3]	[4]	[5]
QI4_e	ACO	e.	Self-improving	[1]	[2]	[3]	[4]	[5]
QI4_f	AFO	f.	Approachable	[1]	[2]	[3]	[4]	[5]
QI4_g	AFO	g.	Hospitable	[1]	[2]	[3]	[4]	[5]

5. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI5_a	APAP	a.	It is important for me to do well compared to other people.	[1]	[2]	[3]	[4]	[5]
QI5_b	E	b.	I don't mind being the center of attention.	[1]	[2]	[3]	[4]	[5]
QI5_c	I-R	c.	I have difficulty understanding abstract ideas.	[1]	[2]	[3]	[4]	[5]
QI5_d	OJSS	d.	I am upset when someone is treated worse than others.	[1]	[2]	[3]	[4]	[5]
QI5_e	AFO	e.	I enjoy being with friends.	[1]	[2]	[3]	[4]	[5]
QI5_f	ACO	f.	I respond positively to competition.	[1]	[2]	[3]	[4]	[5]
QI5_g	E	g.	I talk to a lot of different people at parties.	[1]	[2]	[3]	[4]	[5]
QI5_h	E-R	h.	I have little to say.	[1]	[2]	[3]	[4]	[5]

6. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI6_a	ACO	a.	I am willing to work toward distant goals.	[1]	[2]	[3]	[4]	[5]
QI6_b	C	b.	I am always prepared.	[1]	[2]	[3]	[4]	[5]
QI6_c	E-R	c.	I don't talk a lot.	[1]	[2]	[3]	[4]	[5]
QI6_d	I	d.	I have a rich vocabulary.	[1]	[2]	[3]	[4]	[5]
QI6_e	ES-R	e.	I have frequent mood swings.	[1]	[2]	[3]	[4]	[5]
QI6_f	I	f.	I spend time reflecting on things.	[1]	[2]	[3]	[4]	[5]

7. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI7_a	ES-R	a.	I often feel blue.	[1]	[2]	[3]	[4]	[5]
QI7_b	APAV	b.	My fear of performing poorly is often what motivates me.	[1]	[2]	[3]	[4]	[5]
QI7_c	ES	c.	I seldom feel blue.	[1]	[2]	[3]	[4]	[5]
QI7_d	VJSS	d.	It makes me angry when others get an award which I have earned.	[1]	[2]	[3]	[4]	[5]
QI7_e	E-R	e.	I don't like to draw attention to myself.	[1]	[2]	[3]	[4]	[5]
QI7_f	APAV	f.	My fear of performing poorly on new tasks is often what motivates me.	[1]	[2]	[3]	[4]	[5]
QI7_g	A	g.	I take time out for others.	[1]	[2]	[3]	[4]	[5]
QI7_h	APAV	h.	I just want to avoid doing poorly when I start new tasks.	[1]	[2]	[3]	[4]	[5]

8. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI8_a	AFO	a.	I make an effort to maintain associations with people.	[1]	[2]	[3]	[4]	[5]
QI8_b	ACO	b.	I am willing to put forth effort to attain excellence.	[1]	[2]	[3]	[4]	[5]
QI8_c	I	c.	I am full of ideas.	[1]	[2]	[3]	[4]	[5]
QI8_d	I	d.	I am quick to understand things.	[1]	[2]	[3]	[4]	[5]
QI8_e	OJSS	e.	I am upset when someone does not get a reward he/she has earned.	[1]	[2]	[3]	[4]	[5]
QI8_f	E	f.	I feel comfortable around people.	[1]	[2]	[3]	[4]	[5]
QI8_g	A-R	g.	I feel little concern for others.	[1]	[2]	[3]	[4]	[5]

9. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI9_a	ES-R	a.	I am easily disturbed.	[1]	[2]	[3]	[4]	[5]
QI9_b	ES-R	b.	I get irritated easily.	[1]	[2]	[3]	[4]	[5]
QI9_c	C	c.	I like order.	[1]	[2]	[3]	[4]	[5]
QI9_d	VJSS	d.	It bothers me when others receive something I deserve.	[1]	[2]	[3]	[4]	[5]
QI9_e	ES-R	e.	I change my mood a lot.	[1]	[2]	[3]	[4]	[5]
QI9_f	AFO	f.	I make an effort to win friendships.	[1]	[2]	[3]	[4]	[5]
QI9_g	APAV	g.	I just want to avoid doing poorly.	[1]	[2]	[3]	[4]	[5]
QI9_h	ACO	h.	I aspire to accomplish difficult tasks.	[1]	[2]	[3]	[4]	[5]

10. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI10_a	C-R	a.	I make a mess of things.	[1]	[2]	[3]	[4]	[5]
QI10_b	OJSS	b.	I get upset when I see someone else treated unfairly.	[1]	[2]	[3]	[4]	[5]
QI10_c	I-R	c.	I do not have a good imagination.	[1]	[2]	[3]	[4]	[5]
QI10_d	E	d.	I am the life of the party.	[1]	[2]	[3]	[4]	[5]
QI10_e	APAV	e.	My goal is to avoid performing poorly.	[1]	[2]	[3]	[4]	[5]
QI10_f	A	f.	I have a soft heart.	[1]	[2]	[3]	[4]	[5]
QI10_g	E	g.	I start conversations.	[1]	[2]	[3]	[4]	[5]
QI10_h	C	h.	I pay attention to details.	[1]	[2]	[3]	[4]	[5]

11. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI11_a	A	a.	I make people feel at ease.	[1]	[2]	[3]	[4]	[5]
QI11_b	E-R	b.	I am quiet around strangers.	[1]	[2]	[3]	[4]	[5]
QI11_c	A	c.	I feel others' emotions.	[1]	[2]	[3]	[4]	[5]
QI11_d	VJSS	d.	I get upset when I feel unfairly treated.	[1]	[2]	[3]	[4]	[5]
QI11_e	ACO	e.	I maintain high standards.	[1]	[2]	[3]	[4]	[5]
QI11_f	I-R	f.	I am not interested in abstract ideas.	[1]	[2]	[3]	[4]	[5]
QI11_g	I	g.	I have excellent ideas.	[1]	[2]	[3]	[4]	[5]
QI11_h	C-R	h.	I shirk my duties.	[1]	[2]	[3]	[4]	[5]

12. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI12_a	C-R	a.	I often forget to put things back in their proper place.	[1]	[2]	[3]	[4]	[5]
QI12_b	A	b.	I am interested in people.	[1]	[2]	[3]	[4]	[5]
QI12_c	ES-R	c.	I worry about things.	[1]	[2]	[3]	[4]	[5]
QI12_d	APAP	d.	It is important for me to do better than others.	[1]	[2]	[3]	[4]	[5]
QI12_e	OJSS	e.	It gets me down to see someone being criticized for things that are ignored with others.	[1]	[2]	[3]	[4]	[5]
QI12_f	ES-R	f.	I get stressed out easily.	[1]	[2]	[3]	[4]	[5]
QI12_g	I	g.	I use difficult words.	[1]	[2]	[3]	[4]	[5]

13. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI13_a	ES-R	a.	I get upset easily.	[1]	[2]	[3]	[4]	[5]
QI13_b	A-R	b.	I am not really interested in others.	[1]	[2]	[3]	[4]	[5]
QI13_c	AFO	c.	I accept people readily.	[1]	[2]	[3]	[4]	[5]
QI13_d	C	d.	I get chores done right away.	[1]	[2]	[3]	[4]	[5]
QI13_e	I	e.	I have a vivid imagination.	[1]	[2]	[3]	[4]	[5]
QI13_f	ES	f.	I am relaxed most of the time.	[1]	[2]	[3]	[4]	[5]
QI13_g	C	g.	I am exacting in my work.	[1]	[2]	[3]	[4]	[5]

14. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI14_a	APAP	a.	My goal in performance situations is to do better than other people.	[1]	[2]	[3]	[4]	[5]
QI14_b	AFO	b.	I enjoy being with people.	[1]	[2]	[3]	[4]	[5]
QI14_c	E-R	c.	I keep in the background.	[1]	[2]	[3]	[4]	[5]
QI14_d	VJSS	d.	I get upset when other people are treated better than me.	[1]	[2]	[3]	[4]	[5]
QI14_e	A-R	e.	I am not interested in other people's problems.	[1]	[2]	[3]	[4]	[5]

15. Please indicate how much each of the following is an accurate description of you.

				Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
QI15_a	C	a.	I follow a schedule.	[1]	[2]	[3]	[4]	[5]
QI15_b	OJSS	b.	I am upset when someone is undeservingly worse off than others.	[1]	[2]	[3]	[4]	[5]
QI15_c	A	c.	I sympathize with others' feelings.	[1]	[2]	[3]	[4]	[5]
QI15_d	VJSS	d.	It bothers me when others receive something that ought to be mine.	[1]	[2]	[3]	[4]	[5]
QI15_e	C-R	e.	I leave my belongings around.	[1]	[2]	[3]	[4]	[5]
QI15_f	A-R	f.	I insult people.	[1]	[2]	[3]	[4]	[5]

16. Below are a number of words describing different feelings and emotions. Please indicate how often you have experienced each of these feelings in the last year.

				Never	Rarely	Some-times	Most of the Time	Always
QI16_a	PA	a.	Active	[1]	[2]	[3]	[4]	[5]
QI16_b	NA	b.	Upset	[1]	[2]	[3]	[4]	[5]
QI16_c	NA	c.	Ashamed	[1]	[2]	[3]	[4]	[5]
QI16_d	PA	d.	Strong	[1]	[2]	[3]	[4]	[5]
QI16_e	NA	e.	Jittery	[1]	[2]	[3]	[4]	[5]
QI16_f	NA	f.	Afraid	[1]	[2]	[3]	[4]	[5]
QI16_g	PA	g.	Excited	[1]	[2]	[3]	[4]	[5]
QI16_h	PA	h.	Attentive	[1]	[2]	[3]	[4]	[5]

17. Below are a number of words describing different feelings and emotions. Please indicate how often you have experienced each of these feelings in the last year.

				Never	Rarely	Sometimes	Most of the Time	Always
QI17_a	NA	a.	Hostile	[1]	[2]	[3]	[4]	[5]
QI17_b	PA	b.	Proud	[1]	[2]	[3]	[4]	[5]
QI17_c	PA	c.	Enthusiastic	[1]	[2]	[3]	[4]	[5]
QI17_d	PA	d.	Alert	[1]	[2]	[3]	[4]	[5]
QI17_e	PA	e.	Inspired	[1]	[2]	[3]	[4]	[5]
QI17_f	PA	f.	Determined	[1]	[2]	[3]	[4]	[5]
QI17_g	NA	g.	Scared	[1]	[2]	[3]	[4]	[5]
QI17_h	PA	h.	Interested	[1]	[2]	[3]	[4]	[5]

18. Below are a number of words describing different feelings and emotions. Please indicate how often you have experienced each of these feelings in the last year.

				Never	Rarely	Sometimes	Most of the Time	Always
QI18_a	NA	a.	Distressed	[1]	[2]	[3]	[4]	[5]
QI18_b	NA	b.	Nervous	[1]	[2]	[3]	[4]	[5]
QI18_c	NA	c.	Guilty	[1]	[2]	[3]	[4]	[5]
QI18_d	NA	d.	Irritable	[1]	[2]	[3]	[4]	[5]

19. Please indicate how much you agree or disagree with each of the following statements.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QI19_a	TVI	a.	Doing the right thing is important to me.	[1]	[2]	[3]	[4]	[5]
QI19_b	SD	b.	I sometimes feel resentful when I don't get my way.	[1]	[2]	[3]	[4]	[5]
QI19_c	TVI	c.	I value doing the right thing.	[1]	[2]	[3]	[4]	[5]
QI19_d	SD	d.	I'm always willing to admit it when I make a mistake.	[1]	[2]	[3]	[4]	[5]
QI19_e	SD	e.	I am sometimes irritated by people who ask favors of me.	[1]	[2]	[3]	[4]	[5]
QI19_f	TVM	f.	I value money a lot.	[1]	[2]	[3]	[4]	[5]
QI19_g	TVM	g.	I really like money.	[1]	[2]	[3]	[4]	[5]
QI19_h	TVM	h.	Money is important to me.	[1]	[2]	[3]	[4]	[5]

20. Please indicate how much you agree or disagree with each of the following statements.

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QI20_a	SD	a.	I have never deliberately said something that hurt someone's feelings.	[1]	[2]	[3]	[4]	[5]
QI20_b	SD	b.	No matter who I'm talking to, I'm always a good listener.	[1]	[2]	[3]	[4]	[5]
QI20_c	TVM-R	c.	Most things in life are more important than money.	[1]	[2]	[3]	[4]	[5]
QI20_d	SD	d.	There have been times when I was quite jealous of the good fortune of others.	[1]	[2]	[3]	[4]	[5]
QI20_e	SD	e.	I have never been irked when people expressed ideas very different from my own.	[1]	[2]	[3]	[4]	[5]
QI20_f	SD	f.	There have been occasions when I took advantage of someone.	[1]	[2]	[3]	[4]	[5]
QI20_g	TVI	g.	I want to do things that are important.	[1]	[2]	[3]	[4]	[5]
QI20_h	SD	h.	It is sometimes hard for me to go on with my work if I am not encouraged.	[1]	[2]	[3]	[4]	[5]

21. Please indicate how much you agree or disagree with each of the following statements.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QI21_a	SD	a.	I sometimes try to get even rather than forgive and forget.	[1]	[2]	[3]	[4]	[5]
QI21_b	SD	b.	On a few occasions, I have given up doing something because I thought too little about my ability.	[1]	[2]	[3]	[4]	[5]
QI21_c	SD	c.	I am always courteous, even to people who are disagreeable.	[1]	[2]	[3]	[4]	[5]
QI21_d	SD	d.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	[1]	[2]	[3]	[4]	[5]
QI21_e	TV I	e.	Doing a job right is important to me.	[1]	[2]	[3]	[4]	[5]

Now we would like to ask you a few questions about your background and experiences. Please remember that your answers are completely confidential. Please answer honestly. Type in the required information or mark the indicated spaces for your responses.

[QI22] 22. Are you currently a student at the University of Arkansas (pick one)?

[1] Yes ---------- Go to Question 22a
[2] No ---------- Go to Question 23

[QI22a CA] 22a. What is your current college GPA? _____

[QI23] 23. Have you taken the SAT (pick one)?

[1] Yes ---------- Go to Question 23a
[2] No ---------- Go to Question 23

[QI23a CA] 23a. What is your SAT score? _____

[QI24] 24. Have you taken the ACT (pick one)?

[1] Yes ---------- Go to Question 24a
[2] No ---------- Go to End of Questionnaire I

[QI24a CA] 24a. What is your ACT score? _____

Thank you for completing Questionnaire I!

QUESTIONNAIRE II

Before you start TASK1, we have some questions for you. Please answer these questions as candidly as you can. Remember that your answers are completely confidential. No one outside the project staff will ever know your answers.

1. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII1_a	1POM	a.	The better I perform on this task, the more money I will make.	[1]	[2]	[3]	[4]	[5]
QII1_b	1POI-R	b.	My performance on this task will not affect how content I feel about this task.	[1]	[2]	[3]	[4]	[5]
QII1_c	1POM	c.	How much money I make depends on how well I perform this task.	[1]	[2]	[3]	[4]	[5]
QII1_d	1MOT	d.	I am very motivated to do well on this task.	[1]	[2]	[3]	[4]	[5]
QII1_e	1EFT	e.	I want to work hard in this session.	[1]	[2]	[3]	[4]	[5]

2. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII2_a	1EFT	a.	I will probably exert a lot of effort on this task.	[1]	[2]	[3]	[4]	[5]
QII2_b	1MOT	b.	I feel driven to do well on this task.	[1]	[2]	[3]	[4]	[5]
QII2_c	1POI	c.	How good I feel about this task depends on how well I perform.	[1]	[2]	[3]	[4]	[5]
QII2_d	1MOT	d.	I really want to do well.	[1]	[2]	[3]	[4]	[5]
QII2_e	1SVM	e.	The money I can make on this task is important to me.	[1]	[2]	[3]	[4]	[5]
QII2_f	1EP	f.	How well I do on this task depends on how much effort I put into it.	[1]	[2]	[3]	[4]	[5]

3. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII3_a	1EP-R	a.	The effort that I put into this task is not related to my performance on this task.	[1]	[2]	[3]	[4]	[5]
QII3_b	1SVI	b.	I want to feel good about myself by performing well on this task.	[1]	[2]	[3]	[4]	[5]
QII3_c	1POM	c.	It is likely that I will make more money if I perform well on this task.	[1]	[2]	[3]	[4]	[5]
QII3_d	1SVM	d.	I value the money that I can earn for this task.	[1]	[2]	[3]	[4]	[5]

4. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QII4_a	1SVI	a.	I want to do the right thing by performing well on this task.	[1]	[2]	[3]	[4]	[5]
QII4_b	1MOT	b.	I am motivated to perform well on this task.	[1]	[2]	[3]	[4]	[5]
QII4_c	1POI	c.	The better my performance on this task, the better I will feel about myself.	[1]	[2]	[3]	[4]	[5]
QII4_d	1SVM	d.	I want the money I can make for this task.	[1]	[2]	[3]	[4]	[5]
QII4_e	1POM	e.	If I perform well, I will make more money.	[1]	[2]	[3]	[4]	[5]

5. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QII5_a	1EFT-R	a.	I plan to take it easy while performing this task.	[1]	[2]	[3]	[4]	[5]
QII5_b	1EP	b.	If I try hard, I will do well on this task.	[1]	[2]	[3]	[4]	[5]
QII5_c	1MOT-R	c.	I do not care about my performance on this task.	[1]	[2]	[3]	[4]	[5]
QII5_d	1EP	d.	There is a good chance that my performance will be high on this task.	[1]	[2]	[3]	[4]	[5]

6. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QII6_a	1EP	a.	If I put my mind to it, I should be able to perform this task well.	[1]	[2]	[3]	[4]	[5]
QII6_b	1POI	b.	If I perform this task well, I will feel that I have done something worthwhile.	[1]	[2]	[3]	[4]	[5]
QII6_c	1EFT	c.	I plan to work hard in this session.	[1]	[2]	[3]	[4]	[5]
QII6_d	1POI	d.	It is likely that I will feel that I have done something worthwhile if I perform well on this task.	[1]	[2]	[3]	[4]	[5]
QII6_e	1EFT	e.	I will try really hard on this task.	[1]	[2]	[3]	[4]	[5]
QII6_f	1POM -R	f.	My performance on this task will not affect how much money I make.	[1]	[2]	[3]	[4]	[5]
QII6_g	1SVM	g.	Getting paid for this task is quite valuable to me.	[1]	[2]	[3]	[4]	[5]

7. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QII7_a	1MCR	a.	There is a small difference in the most and the least money I could make in this session.	[1]	[2]	[3]	[4]	[5]
QII7_b	1MCC	b.	The maximum amount of money I can earn on this task is large.	[1]	[2]	[3]	[4]	[5]
QII7_c	1FTC	c.	Pay for this task could be distributed to group members differently.	[1]	[2]	[3]	[4]	[5]
QII7_d	1FT-R	d.	I really don't agree with how I will be paid for this session.	[1]	[2]	[3]	[4]	[5]
QII7_e	1FT	e.	The approach to distributing pay for this task is fair.	[1]	[2]	[3]	[4]	[5]
QII7_f	1FTC	f.	I think my pay should be based only on my own performance.	[1]	[2]	[3]	[4]	[5]
QII7_g	1MCR	g.	There is a large difference in the most and the least money I could make in this session.	[1]	[2]	[3]	[4]	[5]
QII7_h	1MCAR	h.	I hope my group performs well.	[1]	[2]	[3]	[4]	[5]

8. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII8_a	1FTC	a.	I don't think how much I make should depend on my group's performance.	[1]	[2]	[3]	[4]	[5]
QII8_b	1FTC	b.	I think pay should be distributed to group members differently for this session.	[1]	[2]	[3]	[4]	[5]
QII8_c	1MCR-R	c.	There is a small difference in the most and least money my group could make in this session.	[1]	[2]	[3]	[4]	[5]
QII8_d	1FTC	d.	I wish they had used a different way to distribute pay to group members in this study.	[1]	[2]	[3]	[4]	[5]
QII8_e	1MCR	e.	There is a big difference in the most and least money my group could make in this session.	[1]	[2]	[3]	[4]	[5]
QII8_f	1MCAR	f.	My own performance will make a big difference in how much money I make in this session.	[1]	[2]	[3]	[4]	[5]

9. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII9_a	1MCAR	a.	Pay on this task is based on my group's performance.	[1]	[2]	[3]	[4]	[5]
QII9_b	1MCAR	b.	I really want my group to do well in this session.	[1]	[2]	[3]	[4]	[5]
QII9_c	1FT	c.	The way pay is distributed in this study is fair.	[1]	[2]	[3]	[4]	[5]
QII9_d	1MCAR	d.	How much I make in this session depends on my group's performance.	[1]	[2]	[3]	[4]	[5]
QII9_e	1MCAR	e.	How much money I make in this session depends on my own performance.	[1]	[2]	[3]	[4]	[5]
QII9_f	1FT	f.	The pay for this task is fair.	[1]	[2]	[3]	[4]	[5]

10. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK1).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QII10_a	1MCAR	a.	I really want to do well in this session.	[1]	[2]	[3]	[4]	[5]
QII10_b	1MCF	b.	The minimum amount of money I can earn on this task is small.	[1]	[2]	[3]	[4]	[5]
QII10_c	1FTC	c.	Pay for this task should be distributed to group members differently.	[1]	[2]	[3]	[4]	[5]
QII10_d	1MCAR	d.	Pay on this task is based on my individual performance.	[1]	[2]	[3]	[4]	[5]
QII10_e	1MCAR	e.	The group's performance will make a big difference in how much money I make in this session.	[1]	[2]	[3]	[4]	[5]
QII10_f	1FT	f.	Distributing pay based on performance is fair.	[1]	[2]	[3]	[4]	[5]

11. Below are several statements regarding the maximum compensation for the task you will be performing (TASK1). Each statement has a missing value. Please fill in the blank for the missing value in each statement in the text box that follows the statement.

QII11_a	1MCC	a.	The most money my group can make in this session is	$_____.
QII11_b	1MCC	b.	The most money I, individually, can make in this session is	$_____.

12. Please indicate how much you agree or disagree with each of the following regarding the maximum amount you can make for the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII12_a	1CV	a.	I would really like to make this much money.	[1]	[2]	[3]	[4]	[5]
QII12_b	1CV	b.	I want to make this amount of money.	[1]	[2]	[3]	[4]	[5]
QII12_c	1CV	c.	I really value this amount of money.	[1]	[2]	[3]	[4]	[5]

13. Below are statements regarding the minimum compensation for the task you will be performing (TASK1). Each statement has a missing value. Please fill in the blank for the missing value in each statement in the text box that follows the statement.

QII13_a	1MCF	a.	The minimum amount of money my group can make in this session is	$_____.
QII13_b	1MCF	b.	The minimum amount of money I, individually, can make in this session is	$_____.

14. Please indicate how much you agree or disagree with each of the following regarding the minimum amount you can make for the task you will be performing (TASK1).

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QII14_a	1FV	a.	I would really like to make this much money.	[1]	[2]	[3]	[4]	[5]
QII14_b	1FV	b.	I want to make this amount of money.	[1]	[2]	[3]	[4]	[5]
QII14_c	1FV	c.	I really value this amount of money.	[1]	[2]	[3]	[4]	[5]

Thank you for completing Questionnaire II!

QUESTIONNAIRE III

We have a few quick questions for you while we calculate performance.

[QIII1 – 1SIP] 1. How would you rate your performance on the task (TASK1)?

[1] Poor
[2] Fair
[3] Good
[4] Very Good
[5] Excellent

[QIII2 – 1SGP] 2. How would you rate your group's performance on the task (TASK1)?

[1] Poor
[2] Fair
[3] Good
[4] Very Good
[5] Excellent

[QIII3 – 1SIP] 3. Individual performance is rated as Low, Average, or High. Where do you expect your individual performance will be rated for TASK1?

[1] Low
[2] Average
[3] High

[QIII4 – 1SGP] 4. Group performance is rated as Low, Average, or High. Where do you expect your group's performance will be rated for TASK1?

[1] Low
[2] Average
[3] High

QUESTIONNAIRE IV

Please answer the following questions as candidly as you can. Remember that your answers are completely confidential. No one outside the project staff will ever know your answers.

1. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QIV1_a	1SDN	a.	Upset	[1]	[2]	[3]	[4]	[5]
QIV1_b	1HOP	b.	Hopeful	[1]	[2]	[3]	[4]	[5]
QIV1_c	1FR	c.	Worried	[1]	[2]	[3]	[4]	[5]
QIV1_d	1RLF	d.	Relief	[1]	[2]	[3]	[4]	[5]
QIV1_e	1FR	e.	Tense	[1]	[2]	[3]	[4]	[5]
QIV1_f	1ANG1	f.	Irritated	[1]	[2]	[3]	[4]	[5]
QIV1_g	1FR	g.	Nervous	[1]	[2]	[3]	[4]	[5]
QIV1_h	1HPP2	h.	Enthusiastic	[1]	[2]	[3]	[4]	[5]
QIV1_i	1ANG2	i.	Mad	[1]	[2]	[3]	[4]	[5]

2. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QIV2_a	1SDN	a.	Discouraged	[1]	[2]	[3]	[4]	[5]
QIV2_b	1HPP1	b.	Cheerful	[1]	[2]	[3]	[4]	[5]
QIV2_c	1HOP	c.	Eager	[1]	[2]	[3]	[4]	[5]
QIV2_d	1SDN	d.	Sad	[1]	[2]	[3]	[4]	[5]
QIV2_e	1ANG1	e.	Annoyed	[1]	[2]	[3]	[4]	[5]
QIV2_f	1SDN	f.	Disappointed	[1]	[2]	[3]	[4]	[5]
QIV2_g	1GLT	g.	Guilt	[1]	[2]	[3]	[4]	[5]
QIV2_h	1FR	h.	Anxious	[1]	[2]	[3]	[4]	[5]
QIV2_i	1GLT	i.	Shame	[1]	[2]	[3]	[4]	[5]

3. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QIV3_a	1HOP	a.	Optimistic	[1]	[2]	[3]	[4]	[5]
QIV3_b	1HPP2	b.	Excited	[1]	[2]	[3]	[4]	[5]
QIV3_c	1HPP1	c.	Joyful	[1]	[2]	[3]	[4]	[5]
QIV3_d	1HPP2	d.	Thrilled	[1]	[2]	[3]	[4]	[5]
QIV3_e	1HPP1	e.	Happy	[1]	[2]	[3]	[4]	[5]
QIV3_f	1ANG2	f.	Angry	[1]	[2]	[3]	[4]	[5]
QIV3_g	1GLT	g.	Regret	[1]	[2]	[3]	[4]	[5]
QIV3_h	1ANG1	h.	Aggravated	[1]	[2]	[3]	[4]	[5]
QIV3_i	1ANG2	i.	Hostile	[1]	[2]	[3]	[4]	[5]

4. We would like to know how you feel about the way pay was distributed in your group for TASK1. Please indicate how much you agree or disagree with the following.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QIV4_a	1PJ	a.	Pay is distributed fairly among my group members.	[1]	[2]	[3]	[4]	[5]
QIV4_b	1PJ	b.	I think the way pay is distributed among group members is just.	[1]	[2]	[3]	[4]	[5]
QIV4_c	1PJ	c.	I like the way pay is distributed in my group.	[1]	[2]	[3]	[4]	[5]
QIV4_d	1PJ	d.	It makes sense to distribute money across group members this way.	[1]	[2]	[3]	[4]	[5]
QIV4_e	1PJ	e.	I agree with the way my group members were paid.	[1]	[2]	[3]	[4]	[5]

5. In this section, we would like your reactions to how much money you made for the TASK1 session. Please answer these questions as honestly as possible. To what extent does how much money you made...

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QIV5_a	1DJ	a.	...reflect the effort you have put into your work?	[1]	[2]	[3]	[4]	[5]
QIV5_b	1DJ	b.	…reflect what you have contributed to the task?	[1]	[2]	[3]	[4]	[5]
QIV5_c	1DJ	c.	…reflect how hard you worked on the task?	[1]	[2]	[3]	[4]	[5]
QIV5_d	1DJ	d.	…reflect what you should have made?	[1]	[2]	[3]	[4]	[5]

6. In this section, we would like your reactions to how much money you made for the TASK1 session. Please answer these questions as honestly as possible. To what extent is how much money you made...

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QIV6_a	1DJ-R	a.	…really unfair considering your hard work?	[1]	[2]	[3]	[4]	[5]
QIV6_b	1IJ	b.	…consistent with what you expected?	[1]	[2]	[3]	[4]	[5]
QIV6_c	1DJ	c.	…fair?	[1]	[2]	[3]	[4]	[5]
QIV6_d	1IJ	d.	…consistent with what you were told?	[1]	[2]	[3]	[4]	[5]
QIV6_e	1DJ	e.	...appropriate for the work you have completed?	[1]	[2]	[3]	[4]	[5]
QIV6_f	1DJ	f.	...justified, given your performance?	[1]	[2]	[3]	[4]	[5]

7. The statements below describe various reactions that you may have about how much money you made for the TASK1 session. For each statement, decide how satisfied or dissatisfied you feel about that aspect of your pay. How satisfied are you with...

				Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
QIV7_a	1PSL	a.	…the size of your pay for performance on this task?	[1]	[2]	[3]	[4]	[5]
QIV7_b	1PSS	b.	…the pay structure used for this task?	[1]	[2]	[3]	[4]	[5]
QIV7_c	1PSS	c.	…the differences in pay across performance levels on the task?	[1]	[2]	[3]	[4]	[5]
QIV7_d	1PSL	d.	…the level of pay you earned for performance on this task?	[1]	[2]	[3]	[4]	[5]
QIV7_e	1PSL	e.	…the level of pay you earned for this task?	[1]	[2]	[3]	[4]	[5]
QIV7_f	1PSS	f.	…the way pay was distributed among group members?	[1]	[2]	[3]	[4]	[5]

8. The statements below describe various reactions that you may have about how much money you made for the TASK1 session. For each statement, decide how satisfied or dissatisfied you feel about that aspect of your pay. How satisfied are you with...

				Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
QIV8_a	1PSL	a.	…the size of your pay for this task?	[1]	[2]	[3]	[4]	[5]
QIV8_b	1PSS	b.	…the way pay was administered to group members?	[1]	[2]	[3]	[4]	[5]
QIV8_c	1PSS	c.	…the way pay was determined?	[1]	[2]	[3]	[4]	[5]
QIV8_d	1PSL	d.	…the amount of money you made for performing this task?	[1]	[2]	[3]	[4]	[5]
QIV8_e	1PSA	e.	…the information you were given about the pay structure?	[1]	[2]	[3]	[4]	[5]
QIV8_f	1PSL	f.	…the amount of money you made for this task?	[1]	[2]	[3]	[4]	[5]

9. The statements below describe how you feel about the group with which you worked on this task. Please indicate how much you agree or disagree with each of the following.

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV9_a	1GL-R	a.	I would prefer to be in a different group.	[1]	[2]	[3]	[4]	[5]
QIV9_b	1GL	b.	I like the people in my group.	[1]	[2]	[3]	[4]	[5]
QIV9_c	1GL-R	c.	I don't like the other people in my group.	[1]	[2]	[3]	[4]	[5]

QUESTIONNAIRE IV (CONTINUED)

Before you start TASK2, we have a few more questions for you. Please answer these questions as candidly as you can. Remember that your answers are completely confidential. No one outside the project staff will ever know your answers.

10. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV10_a	2POM	a.	The better I perform on this task, the more money I will make.	[1]	[2]	[3]	[4]	[5]
QIV10_b	2POI-R	b.	My performance on this task will not affect how content I feel about this task.	[1]	[2]	[3]	[4]	[5]
QIV10_c	2POM	c.	How much money I make depends on how well I perform this task.	[1]	[2]	[3]	[4]	[5]
QIV10_d	2MOT	d.	I am very motivated to do well on this task.	[1]	[2]	[3]	[4]	[5]
QIV10_e	2EFT	e.	I want to work hard in this session.	[1]	[2]	[3]	[4]	[5]

11. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV11_a	2EFT	a.	I will probably exert a lot of effort on this task.	[1]	[2]	[3]	[4]	[5]
QIV11_b	2MOT	b.	I feel driven to do well on this task.	[1]	[2]	[3]	[4]	[5]
QIV11_c	2POI	c.	How good I feel about this task depends on how well I perform.	[1]	[2]	[3]	[4]	[5]
QIV11_d	2MOT	d.	I really want to do well.	[1]	[2]	[3]	[4]	[5]
QIV11_e	2SVM	e.	The money I can make on this task is important to me.	[1]	[2]	[3]	[4]	[5]
QIV11_f	2EP	f.	How well I do on this task depends on how much effort I put into it.	[1]	[2]	[3]	[4]	[5]

12. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV12_a	2EP-R	a.	The effort that I put into this task is not related to my performance on this task.	[1]	[2]	[3]	[4]	[5]
QIV12_b	2SVI	b.	I want to feel good about myself by performing well on this task.	[1]	[2]	[3]	[4]	[5]
QIV12_c	2POM	c.	It is likely that I will make more money if I perform well on this task.	[1]	[2]	[3]	[4]	[5]
QIV12_d	2SVM	d.	I value the money that I can earn for this task.	[1]	[2]	[3]	[4]	[5]

13. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV13_a	2SVI	a.	I want to do the right thing by performing well on this task.	[1]	[2]	[3]	[4]	[5]
QIV13_b	2MOT	b.	I am motivated to perform well on this task.	[1]	[2]	[3]	[4]	[5]
QIV13_c	2POI	c.	The better my performance on this task, the better I will feel about myself.	[1]	[2]	[3]	[4]	[5]
QIV13_d	2SVM	d.	I want the money I can make for this task.	[1]	[2]	[3]	[4]	[5]
QIV13_e	2POM	e.	If I perform well, I will make more money.	[1]	[2]	[3]	[4]	[5]

14. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV14_a	2EFT-R	a.	I plan to take it easy while performing this task.	[1]	[2]	[3]	[4]	[5]
QIV14_b	2EP	b.	If I try hard, I will do well on this task.	[1]	[2]	[3]	[4]	[5]
QIV14_c	2MOT-R	c.	I do not care about my performance on this task.	[1]	[2]	[3]	[4]	[5]
QIV14_d	2EP	d.	There is a good chance that my performance will be high on this task.	[1]	[2]	[3]	[4]	[5]

15. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV15_a	2EP	a.	If I put my mind to it, I should be able to perform this task well.	[1]	[2]	[3]	[4]	[5]
QIV15_b	2POI	b.	If I perform this task well, I will feel that I have done something worthwhile.	[1]	[2]	[3]	[4]	[5]
QIV15_c	2EFT	c.	I plan to work hard in this session.	[1]	[2]	[3]	[4]	[5]
QIV15_d	2POI	d.	It is likely that I will feel that I have done something worthwhile if I perform well on this task.	[1]	[2]	[3]	[4]	[5]
QIV15_e	2EFT	e.	I will try really hard on this task.	[1]	[2]	[3]	[4]	[5]
QIV15_f	2POM-R	f.	My performance on this task will not affect how much money I make.	[1]	[2]	[3]	[4]	[5]
QIV15_g	2SVM	g.	Getting paid for this task is quite valuable to me.	[1]	[2]	[3]	[4]	[5]

16. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV16_a	2MCR	a.	There is a small difference in the most and the least money I could make in this session.	[1]	[2]	[3]	[4]	[5]
QIV16_b	2MCC	b.	The maximum amount of money I can earn on this task is large.	[1]	[2]	[3]	[4]	[5]
QIV16_c	2FTC	c.	Pay for this task could be distributed to group members differently.	[1]	[2]	[3]	[4]	[5]
QIV16_d	2FT-R	d.	I really don't agree with how I will be paid for this session.	[1]	[2]	[3]	[4]	[5]
QIV16_e	2FT	e.	The approach to distributing pay for this task is fair.	[1]	[2]	[3]	[4]	[5]
QIV16_f	2FTC	f.	I think my pay should be based only on my own performance.	[1]	[2]	[3]	[4]	[5]
QIV16_g	2MCR	g.	There is a large difference in the most and the least money I could make in this session.	[1]	[2]	[3]	[4]	[5]

17. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV17_a	2FTC	a.	I don't think how much I make should depend on my group's performance.	[1]	[2]	[3]	[4]	[5]
QIV17_b	2FTC	b.	I think pay should be distributed to group members differently for this session.	[1]	[2]	[3]	[4]	[5]
QIV17_c	2MCR-R	c.	There is a small difference in the most and least money my group could make in this session.	[1]	[2]	[3]	[4]	[5]
QIV17_d	2FTC	d.	I wish they had used a different way to distribute pay to group members in this study.	[1]	[2]	[3]	[4]	[5]
QIV17_e	2MCR	e.	There is a big difference in the most and least money my group could make in this session.	[1]	[2]	[3]	[4]	[5]
QIV17_f	2MCAR	f.	My own performance will make a big difference in how much money I make in this session.	[1]	[2]	[3]	[4]	[5]
QIV17_h	2MCAR	h.	I hope my group performs well.	[1]	[2]	[3]	[4]	[5]

18. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV18_a	2MCAR	a.	Pay on this task is based on my group's performance.	[1]	[2]	[3]	[4]	[5]
QIV18_b	2MCAR	b.	I really want my group to do well in this session.	[1]	[2]	[3]	[4]	[5]
QIV18_c	2FT	c.	The way pay is distributed in this study is fair.	[1]	[2]	[3]	[4]	[5]
QIV18_d	2MCAR	d.	How much I make in this session depends on my group's performance.	[1]	[2]	[3]	[4]	[5]
QIV18_e	2MCAR	e.	How much money I make in this session depends on my own performance.	[1]	[2]	[3]	[4]	[5]
QIV18_f	2FT	f.	The pay for this task is fair.	[1]	[2]	[3]	[4]	[5]

19. Please indicate how much you agree or disagree with each of the following regarding the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV19_a	2MCAR	a.	I really want to do well in this session.	[1]	[2]	[3]	[4]	[5]
QIV19_b	2MCF	b.	The minimum amount of money I can earn on this task is small.	[1]	[2]	[3]	[4]	[5]
QIV19_c	2FTC	c.	Pay for this task should be distributed to group members differently.	[1]	[2]	[3]	[4]	[5]
QIV19_d	2MCAR	d.	Pay on this task is based on my individual performance.	[1]	[2]	[3]	[4]	[5]
QIV19_e	2MCAR	e.	The group's performance will make a big difference in how much money I make in this session.	[1]	[2]	[3]	[4]	[5]
QIV19_f	2FT	f.	Distributing pay based on performance is fair.	[1]	[2]	[3]	[4]	[5]

20. Below are several statements regarding the maximum compensation for the task you will be performing (TASK2). Each statement has a missing value. Please fill in the blank for the missing value in each statement in the text box that follows the statement.

QIV20_a	2MCC	a.	The most money my group can make in this session is	$_____.
QIV20_b	2MCC	b.	The most money I, individually, can make in this session is	$_____.

21. Please indicate how much you agree or disagree with each of the following regarding the maximum amount you can make for the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV21_a	2CV	a.	I would really like to make this much money.	[1]	[2]	[3]	[4]	[5]
QIV21_b	2CV	b.	I want to make this amount of money.	[1]	[2]	[3]	[4]	[5]
QIV21_c	2CV	c.	I really value this amount of money.	[1]	[2]	[3]	[4]	[5]

22. Below are statements regarding the minimum compensation for the task you will be performing (TASK2). Each statement has a missing value. Please fill in the blank for the missing value in each statement in the text box that follows the statement.

QIV22_a	2MCF	a.	The minimum amount of money my group can make in this session is	$_____.
QIV22_b	2MCF	b.	The minimum amount of money I, individually, can make in this session is	$_____.

23. Please indicate how much you agree or disagree with each of the following regarding the minimum amount you can make for the task you will be performing (TASK2).

				Strongly Disagree	**Disagree**	**Neither**	**Agree**	**Strongly Agree**
QIV23_a	2FV	a.	I would really like to make this much money.	[1]	[2]	[3]	[4]	[5]
QIV23_b	2FV	b.	I want to make this amount of money.	[1]	[2]	[3]	[4]	[5]
QIV23_c	2FV	c.	I really value this amount of money.	[1]	[2]	[3]	[4]	[5]

Thank you for completing Questionnaire IV!

QUESTIONNAIRE V

We have a few quick questions for you while we calculate performance.

[QV1 – 2SIP] 1. How would you rate your performance on the task (TASK2)?

[1] Poor
[2] Fair
[3] Good
[4] Very Good
[5] Excellent

[QV2 – 2SGP] 2. How would you rate your group's performance on the task (TASK2)?

[1] Poor
[2] Fair
[3] Good
[4] Very Good
[5] Excellent

[QV3 – 2SIP] 3. Individual performance is rated as Low, Average, or High. Where do you expect your individual performance will be rated for TASK2?

[1] Low
[2] Average
[3] High

[QV4 – 2SGP] 4. Group performance is rated as Low, Average, or High. Where do you expect your group's performance will be rated for TASK2?

[1] Low
[2] Average
[3] High

QUESTIONNAIRE VI

Please answer the following questions as candidly as you can. Remember that your answers are completely confidential. No one outside the project staff will ever know your answers.

1. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	**To a Small Extent**	**To Some Extent**	**To a Large Extent**	**To a Very Large Extent**
QVI1_a	2SDN	a.	Upset	[1]	[2]	[3]	[4]	[5]
QVI1_b	2HOP	b.	Hopeful	[1]	[2]	[3]	[4]	[5]
QVI1_c	2FR	c.	Worried	[1]	[2]	[3]	[4]	[5]
QVI1_d	2RLF	d.	Relief	[1]	[2]	[3]	[4]	[5]
QVI1_e	2FR	e.	Tense	[1]	[2]	[3]	[4]	[5]
QVI1_f	2ANG1	f.	Irritated	[1]	[2]	[3]	[4]	[5]
QVI1_g	2FR	g.	Nervous	[1]	[2]	[3]	[4]	[5]
QVI1_h	2HPP2	h.	Enthusiastic	[1]	[2]	[3]	[4]	[5]
QVI1_i	2ANG2	i.	Mad	[1]	[2]	[3]	[4]	[5]

2. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	**To a Small Extent**	**To Some Extent**	**To a Large Extent**	**To a Very Large Extent**
QVI2_a	2SDN	a.	Discouraged	[1]	[2]	[3]	[4]	[5]
QVI2_b	2HPP1	b.	Cheerful	[1]	[2]	[3]	[4]	[5]
QVI2_c	2HOP	c.	Eager	[1]	[2]	[3]	[4]	[5]
QVI2_d	2SDN	d.	Sad	[1]	[2]	[3]	[4]	[5]
QVI2_e	2ANG1	e.	Annoyed	[1]	[2]	[3]	[4]	[5]
QVI2_f	2SDN	f.	Disappointed	[1]	[2]	[3]	[4]	[5]
QVI2_g	2GLT	g.	Guilt	[1]	[2]	[3]	[4]	[5]
QVI2_h	2FR	h.	Anxious	[1]	[2]	[3]	[4]	[5]
QVI2_i	2GLT	i.	Shame	[1]	[2]	[3]	[4]	[5]

3. Below are a number of words describing different feelings and emotions you may have right now. Please indicate the extent to which you are currently experiencing each emotion.

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QVI3_a	2HOP	a.	Optimistic	[1]	[2]	[3]	[4]	[5]
QVI3_b	2HPP2	b.	Excited	[1]	[2]	[3]	[4]	[5]
QVI3_c	2HPP1	c.	Joyful	[1]	[2]	[3]	[4]	[5]
QVI3_d	2HPP2	d.	Thrilled	[1]	[2]	[3]	[4]	[5]
QVI3_e	2HPP1	e.	Happy	[1]	[2]	[3]	[4]	[5]
QVI3_f	2ANG2	f.	Angry	[1]	[2]	[3]	[4]	[5]
QVI3_g	2GLT	g.	Regret	[1]	[2]	[3]	[4]	[5]
QVI3_h	2ANG1	h.	Aggravated	[1]	[2]	[3]	[4]	[5]
QVI3_i	2ANG2	i.	Hostile	[1]	[2]	[3]	[4]	[5]

4. We would like to know how you feel about the way pay was distributed in your group for TASK1. Please indicate how much you agree or disagree with the following.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QVI4_a	2PJ	a.	Pay is distributed fairly among my group members.	[1]	[2]	[3]	[4]	[5]
QVI4_b	2PJ	b.	I think the way pay is distributed among group members is just.	[1]	[2]	[3]	[4]	[5]
QVI4_c	2PJ	c.	I like the way pay is distributed in my group.	[1]	[2]	[3]	[4]	[5]
QVI4_d	2PJ	d.	It makes sense to distribute money across group members this way.	[1]	[2]	[3]	[4]	[5]
QVI4_e	2PJ	e.	I agree with the way my group members were paid.	[1]	[2]	[3]	[4]	[5]

5. In this section, we would like your reactions to how much money you made for the TASK1 session. Please answer these questions as honestly as possible. To what extent does how much money you made...

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QVI5_a	2DJ	a.	...reflect the effort you have put into your work?	[1]	[2]	[3]	[4]	[5]
QVI5_b	2DJ	b.	…reflect what you have contributed to the task?	[1]	[2]	[3]	[4]	[5]
QVI5_c	2DJ	c.	…reflect how hard you worked on the task?	[1]	[2]	[3]	[4]	[5]
QVI5_d	2DJ	d.	…reflect what you should have made?	[1]	[2]	[3]	[4]	[5]

6. In this section, we would like your reactions to how much money you made for the TASK1 session. Please answer these questions as honestly as possible. To what extent is how much money you made...

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QVI6_a	2DJ-R	a.	…really unfair considering your hard work?	[1]	[2]	[3]	[4]	[5]
QVI6_b	2IJ	b.	…consistent with what you expected?	[1]	[2]	[3]	[4]	[5]
QVI6_c	2DJ	c.	…fair?	[1]	[2]	[3]	[4]	[5]
QVI6_d	2IJ	d.	…consistent with what you were told?	[1]	[2]	[3]	[4]	[5]
QVI6_e	2DJ	e.	...appropriate for the work you have completed?	[1]	[2]	[3]	[4]	[5]
QVI6_f	2DJ	f.	...justified, given your performance?	[1]	[2]	[3]	[4]	[5]

7. The statements below describe various reactions that you may have about how much money you made for the TASK1 session. For each statement, decide how satisfied or dissatisfied you feel about that aspect of your pay. How satisfied are you with...

				Very Dissatisfied	**Dissatisfied**	**Neutral**	**Satisfied**	**Very Satisfied**
QVI7_a	2PSL	a.	…the size of your pay for performance on this task?	[1]	[2]	[3]	[4]	[5]
QVI7_b	2PSS	b.	…the pay structure used for this task?	[1]	[2]	[3]	[4]	[5]
QVI7_c	2PSS	c.	…the differences in pay across performance levels on the task?	[1]	[2]	[3]	[4]	[5]
QVI7_d	2PSL	d.	…the level of pay you earned for performance on this task?	[1]	[2]	[3]	[4]	[5]
QVI7_e	2PSL	e.	…the level of pay you earned for this task?	[1]	[2]	[3]	[4]	[5]
QVI7_f	2PSS	f.	…the way pay was distributed among group members?	[1]	[2]	[3]	[4]	[5]

8. The statements below describe various reactions that you may have about how much money you made for the TASK1 session. For each statement, decide how satisfied or dissatisfied you feel about that aspect of your pay. How satisfied are you with...

				Very Dissatisfied	**Dissatisfied**	**Neutral**	**Satisfied**	**Very Satisfied**
QVI8_a	2PSL	a.	…the size of your pay for this task?	[1]	[2]	[3]	[4]	[5]
QVI8_b	2PSS	b.	…the way pay was administered to group members?	[1]	[2]	[3]	[4]	[5]
QVI8_c	2PSS	c.	…the way pay was determined?	[1]	[2]	[3]	[4]	[5]
QVI8_d	2PSL	d.	…the amount of money you made for performing this task?	[1]	[2]	[3]	[4]	[5]
QVI8_e	2PSA	e.	…the information you were given about the pay structure?	[1]	[2]	[3]	[4]	[5]
QVI8_f	2PSL	f.	…the amount of money you made for this task?	[1]	[2]	[3]	[4]	[5]

9. The statements below describe how you feel about the group with which you worked on this task. Please indicate how much you agree or disagree with each of the following.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QVI9_a	2GL-R	a.	I would prefer to be in a different group.	[1]	[2]	[3]	[4]	[5]
QVI9_b	2GL	b.	I like the people in my group.	[1]	[2]	[3]	[4]	[5]
QVI9_c	2GL-R	c.	I don't like the other people in my group.	[1]	[2]	[3]	[4]	[5]

10. It is possible that we will be able to pay people to do this task in the future. The statements below describe your interest in continuing work on this task. Please indicate how much you agree with each of the following statements.

				Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
QVI10_a	IC	a.	I would continue working on this task if I were getting paid.	[1]	[2]	[3]	[4]	[5]
QVI10_b	IC	b.	I am interested in doing additional work on this task for pay.	[1]	[2]	[3]	[4]	[5]
QVI10_c	IC-R-	c.	I don't want to work on this task again even if I am paid to do so.	[1]	[2]	[3]	[4]	[5]
QVI10_d	IC-R-	d.	Working on this task in the future does not interest me even if I would be paid to do so.	[1]	[2]	[3]	[4]	[5]
QVI10_e	IC	e.	I am interested in future work on this task for pay.	[1]	[2]	[3]	[4]	[5]
QVI10_f	IC-R-	f.	I'm not interested in working on this task again.	[1]	[2]	[3]	[4]	[5]

[QVI11 - IC] 11. Would you like us to contact you if we need people to work on this task in the future?

[1] Yes
[2] No

12. When completing the tasks today, to what extent did you feel...

				Not at all	To a Small Extent	To Some Extent	To a Large Extent	To a Very Large Extent
QVI12_a	FG	a.	…you were working with others.	[1]	[2]	[3]	[4]	[5]
QVI12_b	FG	b.	…you were part of a group.	[1]	[2]	[3]	[4]	[5]
QVI12_c	FG	c.	…you completed the task as a member of a group.	[1]	[2]	[3]	[4]	[5]
QVI12_d	FG	d.	…the task was a group task.	[1]	[2]	[3]	[4]	[5]
QVI12_e	FG	e.	…you were working alone.	[1]	[2]	[3]	[4]	[5]

We just have a few additional questions about you.

[QVI13] 13. Are you (pick one)?

[1] Male
[2] Female

[QVI14] 14. What is your race (pick one)?

[1] White
[2] Black or African-American
[3] Hispanic or Latino/Latina
[4] Native American or Alaskan Native
[5] Asian, Pacific Islander, or Indian (from India)
[6] Other, including mixed

[QVI15] 15. How old were you on your last birthday? _____ years

[QVI16] 16. Which of the following best describes your current relationship status (pick one)?

[1] Never Married
[2] Currently Married
[3] Divorced
[4] Widowed
[5] Other

[QVI17] 17. About how much money do you spend each month? Include all your monthly expenses, such as utilities, groceries, and entertainment. $_____

[QVI18] 18. Are you currently employed (select one)?

[1] Yes ---------- Go to Question 18a
[2] No ---------- Go to End of Study

[QVI18_a] 18a. How long have you been employed (in months) by your current organization? _____ months

[QVI18_b] 18b. How many hours per week do you work for pay? _____ hours

[QVI18_c] 18c. In what industry is your main job?

[1] Agriculture, Forestry, or Fishery
[2] Mining and Construction
[3] Manufacturing
[4] Public Administration
[5] Transportation
[6] Communications
[7] Retail
[8] Finance, Insurance, or Real Estate
[9] Restaurant Service
[10] Repair Service
[11] Recreation Service
[12] Other

Thank you!