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The Effects of Monthly Expenses on Worker Choice of the Percent Age of Incentive Pay to Expected Total Pay: A Simulation

Shezeen Oah

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THE EFFECTS OF MONTHLY EXPENSES ON WORKER CHOICE OF
THE PERCENTAGE OF INCENTIVE PAY TO EXPECTED
TOTAL PAY: A SIMULATION

by

Shezeen Oah

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in partial fulfillment of the
requirements for the
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Department of Psychology

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August 1989
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1989
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I would like to express my appreciation to those who made this study possible. First, I would like to thank Dr. Alyce Dickinson who introduced me to the field of organizational behavior management and was responsible for my interest in it. I will not forget that she encouraged me to study this field thus making the current study possible. I would also like to thank Dr. Jack Michael for providing me with knowledge of behavior analysis and for his invaluable and friendly advice during the course of this study. I also acknowledge the members of Dr. Alyce Dickinson's research team for their guidance and suggestions.

Finally, I express the most appreciation and gratitude to my parents. This study could not have been completed without their support during the past three years and during my earlier education as well.

Shezeen Oah
THE EFFECTS OF MONTHLY EXPENSES ON WORKER CHOICE OF
THE PERCENTAGE OF INCENTIVE PAY TO EXPECTED
TOTAL PAY: A SIMULATION

Shezeen Oah, M.A.
Western Michigan University, 1989

Because studies that examine factors that affect worker preference for different pay systems are difficult to conduct in the workplace, the feasibility of using a laboratory simulation was assessed. The dependent variable was subject choice of the percentage of incentive pay to total pay. The independent variable was the percentage of monthly expenses to monthly income. The higher the incentive percentage the greater the potential earnings, but the greater the variability of pay and the probability that subjects would be unable to pay expenses. Work performance was simulated by the roll of a die. Thirty college students worked in groups of three. Ten groups were exposed to five different expense sequences.

Most subjects displayed sensitivity to the expense manipulations, and eighteen responded consistently to their systematic manipulation. While the generality of the results to a real environment was not assessed, the fact that the independent variable controlled responding is encouraging.
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CHAPTER I

INTRODUCTION

Frederick Taylor, the founder of scientific management, first stimulated interest in money as a motivational tool for spurring production. One of the elements of his philosophy of management concerned the relationship between management and labor, and he argued that money was what the worker wanted most from management (Opsahl & Dunnette, 1966). He further maintained that workers would be more productive if their pay was contingent upon performance. Since Taylor's time, incentive pay systems have been developed for both nonmanagerial and managerial employees.

When monetary incentives have been compared with hourly pay in laboratory and industrial settings, they have consistently increased productivity (Bushhouse, Feeney, Dickinson, & O'Brien, 1982; Farr, 1976; Gaetani, Hoxeng, & Austin, 1985; Locke, 1982; Nash & Carroll, 1975; Orpen, 1982; Terborg & Miller, 1978; Vough, 1979; Weinstein & Holzbach, 1973). The increases in productivity have often been quite large. For example, Jenkins and Gupta (1982) stated that incentive systems have increased productivity by several hundred percent in a number of organizations, Vough (1979) indicated that they have resulted in a 200% increase in productivity over a 10-year period at IBM, and Dierks and McNally (1987) have reported productivity increases of 200 to 300% at Union National Bank in Little Rock, Arkansas. Further, Locke (1982) concluded, based on a review of the experimental literature, that monetary incentives increased productivity considerably more than
other popular management techniques such as goal setting, employee participation, and job enrichment. Although some researchers remain suspicious about the effectiveness of performance-contingent pay, most of the concerns surround implementation problems such as establishing appropriate standards upon which to base incentives, ascertaining the amount of incentives that will affect performance, determining the appropriateness of incentives when employees have little control over their own performance, and determining how frequently incentives must be provided in order for them to be effective (Lawler, 1971; Mihal, 1983; Kesselman, Wood & Hagen, 1974; Kopelman, 1983).

Although incentive systems were once quite popular, their popularity decreased in the mid to late 1960s. Reasons for the decreased popularity include objections by labor unions, difficulties in developing standards of job performance upon which to base monetary incentives, the emergence of motivational theories that opposed the use of money as a motivational tool, and criticisms by social scientists that incentive systems disrupt interpersonal relationships among employees (Herzberg, 1966; Jenkins & Gupta, 1982; Locke, 1982; Maslow, 1943; McGregor, 1960). However, because of recent declines in productivity indices and increased competition from foreign markets, incentive pay systems have again become popular. For example, a recent survey by the American Productivity Center revealed that 75% of the 1600 respondents had implemented a pay-for-performance plan within the past five years (O'Dell, 1986). Further, discussions of such plans have appeared with increasing frequency in business publications (Dierks & McNally, 1987; Dolan, 1985; Kantor, 1987; Murray, 1987; Skrzynski, 1987).

The success of any performance management system depends not only on its effectiveness but also on its acceptability by workers. If incentive systems are unattractive to workers they will be hard to implement, may reduce the company's
ability to compete effectively in the hiring market, and may increase absenteeism, turnover, and the number of grievances filed; factors that correlate highly with employee dissatisfaction. Yet, as pointed out by Mawhinney (1984) and Gupta (1980) few studies have examined whether employees prefer performance contingent pay or hourly pay.

The results of several studies indicate that performance contingent pay can influence the relationship between employee productivity and satisfaction (Cherrington, Reitz, & Scott, 1971; Kesselman, Wood, & Hagen, 1974; Orpen, 1982). When rewards are contingent upon performance, there is a high positive relationship between worker satisfaction and productivity: that is, the greater the worker's productivity, the higher the worker's job satisfaction. When rewards are not contingent upon performance, there is little or no relationship between productivity and satisfaction.

Although the data from the preceding studies suggest that employee satisfaction and productivity will be positively related when pay is tied to performance, they do not imply that workers will be more satisfied with or prefer contingent pay over hourly pay. The results of the few investigations that have examined this issue have been mixed.

Gupta (1980) examined the relationship between contingent pay and employee satisfaction by surveying 649 employees in five midwestern organizations. The pay procedures of the companies were classified according to the degree of reward contingency based on verbal reports of employees, on-the-job observations, and an analysis of pay policies (e.g., was pay fixed by contract or by a formal wage structure with few individual deviations, was base pay supplemented by organization-wide bonuses, or was base pay supplemented by work-group bonuses). Differences in the amount of pay received by employees in the five organizations were controlled
statistically. Employee satisfaction was measured by responses to interview questions. The results indicated a positive relationship between the degree of reward contingency and employee satisfaction: employees who worked under more contingent pay systems reported greater satisfaction. As Gupta pointed out, however, these data must be interpreted cautiously because the verbal report measures were only moderately reliable, results were based on correlational data which preclude causal statements (one cannot conclude that the reward-contingency caused employee satisfaction), and other differences between the organizations may have contributed to the differences in employee satisfaction.

Farr (1976) reported conflicting results in a laboratory study that compared the effects of two types of group incentive systems, individual incentives (piece-work pay) and hourly pay. In one of the group incentive conditions, the total amount earned by three group members was divided equally. In the other, the total amount earned was divided differentially depending upon performance: one-half of the total amount earned was given to the top performer, one-third to the middle performer, and one-sixth to the low performer. Satisfaction with pay was measured by responses to a questionnaire; a modified version of the Job Description Index (Smith, Kendall, & Hulin, 1969). Individual and group incentives resulted in greater productivity than hourly pay, however, satisfaction with pay was not significantly affected by the payment condition.

In both of the preceding studies, the amount of money that could be earned under the various pay systems was controlled so that differences in employee satisfaction could be attributed to the payment systems rather than to the amount earned. However, when incentive systems are implemented in work settings, employees are usually able to earn more money if they perform well than what they could earn under a guaranteed hourly wage system. On the other hand, if workers do not perform
well, they often earn less than what they could earn under an hourly wage system. Although employees are given the opportunity to earn more money, the amount earned becomes potentially more variable since it depends upon performance. From the employee's perspective, then, under incentive systems, larger potential earnings are being traded for a stable guaranteed amount of pay. A more realistic examination of employee preferences for types of compensation systems would, therefore, compare an incentive system that offers higher potential earnings but more variability with either guaranteed hourly wages or with another incentive system that offers lower but less variable earnings.

Hickson (1963), in a nonexperimental case study, reported the results of workers' choice for a compensation system that offered high but variable potential earnings versus one that offered lower more stable earnings. Eighteen workers in a factory had been paid according to an individual incentive plan. Management had reevaluated the performance standards and had proposed an increase in those standards. The union protested the increase of standards and entered into negotiations with management. As a result of these negotiations, workers were offered three options: continuation of the individual incentive plan with increased standards; implementation of a new incentive plan that offered the same increased standards but more stable guaranteed pay with less potential earnings; or rejection of both plans. Under the existing payment plan, workers did not receive any base pay. However, when performance exceeded the standard, the acquisition of earnings was very rapid and high. Under the alternative pay plan, workers received a guaranteed base pay with lower incentive pay for above-average performance. Pay was comparable for average performance under both plans. The general effect was that on poor shifts earnings would be higher under the alternative pay plan and thus less variable over time, but would be lower on a productive shift. Therefore, potentially higher, more
variable pay was being contrasted with lower, more stable pay. Workers unanimously and, according to the author, "enthusiastically" chose the new payment plan. An analysis of the verbal comments made by 12 of the 18 workers indicated that they preferred the new system because there would be more pay for troublesome shifts when output was unavoidably low. Examination of factory records of productivity and pay after the new plan was implemented revealed that individual differences in productivity had increased but differences in earnings had decreased. Differences in pay were reduced by an improvement in pay for those who had earned the least under the old incentive pay plan. Average output by the two top performers exceeded the low performers by 23%, yet their pay differed only by 7%. Twelve of the workers were interviewed six months after the adoption of the new payment plan and all expressed satisfaction with it. "In short, the group had bartered more output, not primarily for more cash but for more security of cash" (Hickson, 1963, p. 99).

When analyzing the results of this study, however, it should be noted that workers were assigned to specific machines and some of the machines regularly had mechanical difficulties. Therefore, the low productivity of some of the workers could, in part, be attributed to the machines. Workers expressed the opinion that the new pay plan protected those who worked on the faulty machines and thus was "fair to both sides." It is not clear that the same results would have been obtained if the machines were equally susceptible to mechanical failures. Nonetheless, these results indicate that under some working conditions, workers may be more satisfied with a less risky, more stable payment system.

Not much is known, except intuitively, about the factors that may influence worker preferences for pay systems that offer stable but lower pay in contrast to pay systems that offer potentially more variable but higher pay. The results of studies that examine worker preference for different types of pay systems will no doubt be
inconsistent until these factors are determined and their effects ascertained. The results of the study by Hickson (1963) suggest that the extent to which workers control their own productivity may be one of those factors. If factors outside of the employees' control can significantly decrease productivity, as was the case in Hickson's study, then it is reasonable for workers to prefer pay systems that provide more guaranteed pay. On the other hand workers may prefer a system that provides higher, but riskier pay if performance is under their control.

Another factor that may influence worker preference is the extent to which workers can earn more money as a larger proportion of their total pay becomes incentive-based. If workers can earn more money by agreeing to have a larger proportion of their total pay based on incentives, then the larger the amount of the increase, the more attractive the higher proportions of incentive pay will be. However, as the proportion of incentive to guaranteed pay increases, the worker's earnings also become potentially more variable because more and more of a worker's total earnings are dependent upon productivity. If productivity varies, wages will vary accordingly. Because workers must be able to rely on meeting monthly living expenses, at some point the advantage of the overall expected increased income may be offset by an increased risk of not having enough money in any given month to meet those expenses. If monthly expenses were only slightly less than monthly income, then a pay system that offered more stable earnings would logically be favored. If monthly expenses were considerably less than monthly income, then a pay system that offered less stable but higher overall earnings would logically be preferred. In the current study, a laboratory simulation was developed to ascertain the extent to which the amount of a worker's monthly expenses influenced his or her preference for stable pay in contrast to more variable, higher pay.
One of the main purposes of the study was to determine whether a simulation could be developed to study factors that affect worker preference for different types of pay systems. Ideally these types of studies would be conducted with real workers in the workplace. Such research, however, is difficult to conduct. Few companies, and probably fewer employees, would permit pay conditions to be systematically altered in order to determine their relative effects on worker satisfaction and preference. Therefore employees may be asked their preference for or satisfaction with the current payment system without having been exposed to alternatives, or without being provided the option of working under different pay systems. As indicated by Hickson (1963), "Giving an opinion in this way is not the same thing as stating a preference to be acted upon" (p. 93). Further, worker preferences may be affected by a large of number of variables that exist in the workplace; variables that cannot be isolated and controlled. Studies across organizations may be confounded by these variables, as was the case in Gupta's study (1980). Simulation studies enable the researcher to isolate and control the independent variables of interest and, as a result, to determine causal relationships between the relevant variables and worker behavior.

In the current study, subjects were given a list of simulated monthly expenses and then were able to choose the payment system they preferred. They were then exposed to that payment system for a simulated month, required to pay their bills, and again permitted to choose the payment system they preferred for the next month. This procedure had two advantages. First, subjects were actually exposed to the various payment systems and their effects in terms of the amount that could be earned monthly and the way in which the variability of wages affected payment of monthly expenses. Second, subject choices were used as the measure of preference rather than verbal reports. Lockhart (1979) advocated the use of choice as a behavioral assessment of human preference, citing data indicating that verbal preference is not
always a valid predictor of behavioral preference. According to Lockhart, the reinforcement for the verbal response is seldom the choice object itself, but rather some unspecified aspect of the situation such as approval from the researcher or colleagues. In a behavioral assessment, however, the choice response is followed by exposure to the chosen condition. Given that the contingencies for verbal reports and actual choice can be very different, it is not surprising that the two methods often yield different results.

Simulation research has the disadvantage that the findings are relevant only to the degree that the simulation captures all of the essential features of the work environment that influence behavior with respect to the independent variable being studied. The current study represented the first attempt to develop a simulation that could be used to examine worker satisfaction with various types of pay systems. If the resulting data were consistent, then the simulation could be used for further research. If the simulation was not successful, the obtained data could be used to refine and revise the simulation permitting its use in the future.
CHAPTER II

DESIGN AND METHODOLOGY

Subjects

Subjects were 30 volunteer male and female undergraduate students enrolled at Western Michigan University. Their ages ranged from 19 to 24. Subjects signed an informed consent form prior to participation. This consent form and the letter from Western Michigan University's Human Subject Institutional Review Board indicating approval of the research can be found in Appendix A and Appendix B.

Setting

Study was conducted in a university study room, a university dormitory lounge or in living rooms of apartments where subjects lived.

General Simulation

Work productivity

Work productivity was determined by having subjects roll a die rather than having them perform any sort of task. Each roll of the die represented one week's productivity and four rolls simulated one month of work. A roll of a die could result in one of six numbers. Because in work settings average productivity is more likely than above- or below-average productivity, four of the six numbers on the die, 2, 3, 4, and 5, were used to designate average performance, one, a roll of 1, was used to
designate below-average performance and one, a roll of 6, was used to designate above-average performance. Therefore, on any one roll, there was a 67% probability that performance would be average, and a 33% probability that performance would either be above- or below-average.

**Pay system**

At the beginning of each simulated month (four rolls of the die) subjects were free to choose whether 0%, 25%, 50%, 75% or 100% of their total pay would be incentive-based. As the proportion of the incentive-based pay increased, so did potential earnings. If performance was average (the most likely possibility, given that, on each roll of the die, there was a 67% probability of obtaining average performance), subjects could earn an additional ten dollars per week (forty dollars per month) for each higher proportion of incentive pay. Therefore, in the 0% incentive-pay condition, the total amount of money that could be earned, given average performance, was $230.00 a week ($920.00 a month); in the 25% incentive-pay condition, $240.00 a week ($960.00 a month); in the 50% incentive-pay condition, $250.00 a week ($1,000.00 a month); in the 75% incentive-pay condition, $260.00 a week ($1,040.00 a month); and in the 100% incentive-pay condition, $270.00 a week ($1,080.00 a month). If subjects rolled an unusually high number of ones or sixes, the amount earned would be lower or higher accordingly. Because the amount of guaranteed base pay decreased as the proportion of incentive pay increased, the potential variability of earnings increased as the amount that could be earned increased. In the 0% incentive-pay condition, weekly guaranteed base pay was $230.00; in the 25% incentive-pay condition, $180.00; in the 50% incentive-pay condition, $125.00; in the 75% incentive-pay condition, $65.00; and in the 100% incentive-pay, $0.00. In the 0% incentive-pay condition, any roll of the die would
result in $230.00, since pay was completely guaranteed. In the other incentive-pay conditions, a roll of a 1, because it represented below-average performance, would result only in the guaranteed pay, rolls of 2, 3, 4 or 5 would result in intermediate earnings in incentives and a roll of 6 would result in considerable earnings in incentives. After each roll of the die, subjects were paid in play money.

Percentage of monthly expenses

The percentage of monthly expenses to total expected earnings (the total amount that would be earned per month for "average performance") was the independent variable. For each simulated month, subjects were provided with a list of fixed and variable monthly expenses that averaged either 85% or 95% of their total expected earnings. These percentages were based on a consumer expenditure survey conducted in 1980-1981 (Norwood, 1985). According to this survey, urban consumers with incomes of $20,000 to $29,000 spent approximately 96% of their annual income and consumers with incomes of $30,000 or more spent approximately 85% of their annual income. Therefore these percentages represented the average expenditures of middle and upper income workers. Because, in this simulation, the expected average earnings increased as the proportion of incentive pay increased, the actual amount of the monthly expenses also increased as the proportion of incentive pay increased. The percentage of monthly expenses, however, remained constant.

General procedure

Subjects selected the proportion of incentive pay they preferred, were provided with monthly expenses that totalled either 85% or 95% of their total expected monthly income and then rolled the die. After each roll of the die, subjects were paid in play
money according to the number on the die. After four rolls of the die, simulating one month of work, subjects then paid their monthly expenses. After paying their monthly expenses, they again selected the proportion of incentive-pay for the following month, and the procedure was repeated. Subjects were provided with monthly expenses that averaged either 85% or 95% of their expected monthly income for several simulated months, and then were exposed to the other percentages of expenses for several simulated months. The study was completed in one session. Three subjects participated in the simulation at the same time. The individual who had the highest amount of money at the end of the simulation was given $5.00, the individual who had the second highest amount was given $3.00, and the individual who had the least amount of money received nothing. The details of the experimental design and procedure are presented in the following sections.

Apparatus/Materials

The apparatus consisted of a die, and a table provided to subjects that indicated the relation between the numbers rolled on the die and the amount of base pay and incentive pay for each percentage of incentive pay. Two record sheets were used: one was used by the experimenter to record subject selection of the percentage of incentive pay for each simulated month and the number rolled on each roll of the die; the other was used by subjects to record their choices of the percentage of incentive pay. The choices recorded by the experimenter and subjects were compared to determine whether any discrepancies occurred. The list of monthly expenses were written on index cards. There were five different sets of cards corresponding to the five proportions of incentive pay, and each set consisted of twelve cards. Within each set, the average amount of monthly expenses were the same, but the various items listed
on the cards, such as clothing and entertainment expenditures and the actual amount of the expenses, differed.

Dependent Variable

The dependent variable was subject choice of the percentage of incentive pay for each simulated month (four rolls of the die). Five choices were available to subjects: 0%, 25%, 50%, 75%, and 100%.

One roll of a die simulated one week's performance, and the number on the face of the die determined the amount of incentive pay. Table 1, on the following page, shows the relation between the total amount of weekly and monthly pay and the percentage of incentive pay.

As indicated previously, the expected total amount of weekly pay (the amount received for "average performance") increased if a subject chose a higher percentage of incentive pay although he or she would earn less money for below-average performance and considerably more money for above-average performance. For example, if a subject chose 25% incentive pay, the base pay was $180 dollars. Rolls of 2, 3, 4, or 5 would result in incentive earnings of $60, for total weekly earnings of $240.00. If a subject selected 50% incentive pay, the base pay was $125.00 and rolls of 2, 3, 4 or 5 would result in incentive earnings of $125.00, for total weekly earnings of $250.00; $10.00 more than if subject had chosen the 25% incentive pay. On the other hand, a roll of 1 would result in total weekly earnings of $180.00 for the 25% incentive condition and only $125.00 for the 50% incentive condition. Therefore, if subjects selected a higher percentage of incentive pay they would increase their expected total amount of weekly pay (the amount of pay for "average performance"), however, they would earn less money for poor performance when compared to lower percentages of incentive pay.
Table 1

The Relation Between the Percentage of Incentive Pay and Earnings According to the Number on the Die

(Unit: dollar)

<table>
<thead>
<tr>
<th>Percentage of Incentive</th>
<th>Base Pay</th>
<th>1</th>
<th>2,3,4,5</th>
<th>6</th>
<th>Total Pay (Base + Incentive) Based on Die</th>
<th>Expected Weekly Total</th>
<th>Expected Monthly Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>230</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>230</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>25</td>
<td>180</td>
<td>0</td>
<td>60</td>
<td>120</td>
<td>180</td>
<td>240</td>
<td>300</td>
</tr>
<tr>
<td>50</td>
<td>125</td>
<td>0</td>
<td>125</td>
<td>250</td>
<td>125</td>
<td>250</td>
<td>375</td>
</tr>
<tr>
<td>75</td>
<td>65</td>
<td>0</td>
<td>195</td>
<td>390</td>
<td>65</td>
<td>260</td>
<td>455</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>0</td>
<td>270</td>
<td>540</td>
<td>0</td>
<td>270</td>
<td>540</td>
</tr>
</tbody>
</table>

230 920
240 960
250 1,000
260 1,040
270 1,080
The variability of earnings increased as the percentage of incentives increased. Under 0% incentive pay, subjects earned $230.00 in guaranteed pay regardless of the number on the die. At the other extreme, under 100% incentive pay, subjects did not receive any guaranteed pay, and a roll of 1 would result in zero weekly earnings, rolls of 2, 3, 4 and 5 would result in weekly earnings of $270.00 and a roll of 6 would result in weekly earnings of $540.00. Therefore, as the percentage of incentive pay increased, the expected total amount of weekly pay increased, but the variability of pay also increased.

Independent Variable

The independent variable was the percentage of the monthly expenses. This variable had two values: 85% or 95% of the subject's total expected monthly income. The actual amount of monthly expenses depended on the subjects' choices of the percentage of incentive pay. As discussed in the dependent variable section, because the expected total amount of monthly income increased if a subject selected a higher percentage of incentive pay, the actual dollar amount of monthly expenses also increased, thereby preserving the percentage of expenses to total expected income.

Because an individual's monthly expenses consists of fixed expenses such as apartment rent, car payments, utility payments, and food, and variable expenses such as entertainment, clothing, and doctor's bills, the expenses provided to the subjects also consisted of fixed and variable expenses. The fixed expenses always equaled the same amount and consisted of $720.00 for the 85% expense condition and $800.00 for the 95% expense condition. The variable expenses increased as the percentage of incentive pay increased so that the total monthly expenses of subjects would equal 85% or 95% of their total expected monthly income. The variable expenses were listed on index cards. There were five sets of cards corresponding to the five
percentages of incentive pay. To provide variety of the variable expenses, there were twelve cards in each set. The amount and type of the variable expenses listed on the twelve cards differed slightly, but the average amount, when added to the fixed expenses, resulted in total expenses of 85% or 95% of the subject’s total expected monthly income. Examples of fixed and variable expenses for the 25% incentive pay condition are provided in Table 2.

Table 2

Examples of Fixed and Variable Expenses for the 25% Incentive Condition

<table>
<thead>
<tr>
<th>Fixed Monthly Expenses</th>
<th>85% Expense Condition</th>
<th>95% Expense Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>$300.00</td>
<td>$350.00</td>
</tr>
<tr>
<td>Food</td>
<td>$150.00</td>
<td>$180.00</td>
</tr>
<tr>
<td>Toiletries</td>
<td>$ 50.00</td>
<td>$ 20.00</td>
</tr>
<tr>
<td>Car payment</td>
<td>$130.00</td>
<td>$150.00</td>
</tr>
<tr>
<td>Utilities</td>
<td>$ 40.00</td>
<td>$ 50.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$ 50.00</td>
<td>$ 50.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Monthly Expenses</th>
<th>85% Expense Condition</th>
<th>95% Expense Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Examination</td>
<td>$ 45.00</td>
<td>Buying a bicycle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$100.00</td>
</tr>
<tr>
<td>Buying a typewriter</td>
<td>$ 50.00</td>
<td>Replace broken window</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 12.00</td>
</tr>
</tbody>
</table>
Each simulated month, subjects selected one of the twelve cards from the appropriate set. If subjects selected a high percentage of incentive pay and then rolled a number of 1s in any one simulated month they would not have sufficient funds to pay their monthly expenses. The higher the percentage of incentive pay, then, the greater the risk of having insufficient funds.

Experimental Design

Subjects worked in groups of three. In each group, the subject with the most amount of play money at the end of the study received $5.00, the subject with the next amount of money received $3.00 and the remaining subject received nothing. A within-subject experimental design was employed. Initially, two groups of three subjects were exposed to the 95% expense condition for 24 simulated months and then to the 85% expense condition for the next 24 simulated months, and two groups of three subjects were exposed to the 85% expense condition and then to the 95% condition, constituting a counterbalanced AB design. The study was conducted in one session that lasted approximately one and a half hours.

After the results were obtained for these four groups, six groups were added to the study. The first extension of the study resulted from the experimenter's belief that subject selection of the percentage of incentive pay was being influenced by the choices of the other group members. To control for this, the experimental procedure was modified so that the subjects could not determine what percentage of incentive pay the other two subjects selected. One group of three subjects was exposed to the 85%-95% experimental design with this procedural modification. Similar to the other groups, subjects were exposed to the 85% expense condition for 24 simulated months and then to the 95% expense condition for 24 simulated months.
In a further extension of the study, two groups of three subjects were assigned to an AA design in which subjects were exposed to the 95% condition for 24 months and again to the 95% condition for another 24 months. This condition was added in order to examine the effects of exposure to the 95% condition over time.

Finally, a reversal design was employed for three groups of three subjects. In this reversal design, subjects were first exposed to the 95% expense condition for 16 simulated months, then to the 85% expense condition for 16 months and then again to the 95% expense condition for 16 months. Table 3 summarizes the number of groups assigned to the various experimental sequences.

Table 3

<table>
<thead>
<tr>
<th>Design</th>
<th>95%-85% (AB)</th>
<th>85%-95% (BA)</th>
<th>85%-95% (BA) modified procedure</th>
<th>95%-95% (AA)</th>
<th>95%-85%-95% (ABA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Subjects</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

* 95% refers to the 95% expense condition and 85% refers to the 85% expense condition.

Procedure

At the beginning of the experiment, subjects were provided with written instructions. These instructions can be found in Appendix C. Due to the complexity
of the instructions, detailed verbal instructions were also provided to the subjects. These verbal instructions can be found in Appendix D. Following these instructions, subjects practiced selecting the percentage of incentive pay and rolling the die. These practice rolls continued until all of the subjects understood the relation between the number on the die and the amount earned and how the percentage of incentive pay affected weekly earnings.

When the experiment began, subjects selected a percentage of incentive pay and rolled the die. After each roll of the die subjects were paid the appropriate amount in play money. After four rolls of the die, one simulated month, subjects were provided with a list of their fixed expenses (which remained constant until the new expense condition was introduced) and selected a variable expense card from the appropriate pile. The variable expenses were added to the fixed expenses. Subjects then paid the expenses. If subjects did not have sufficient funds to cover their expenses, 20% interest was charged on the shortage. This interest, together with the debt, was collected in the following months as soon as subjects had accumulated enough money. After paying expenses, subjects selected the percentage of incentive pay for the following month and the procedure was repeated.

When a new expense condition was introduced, the experimenter recorded the amount saved to that point and collected the play money saved by the subjects. Subjects began the new phase with a zero balance.

All subjects rolled the die 192 times, representing 48 simulated months. The study was completed in one session.

As indicated earlier, one group of subjects was exposed to a modified experimental procedure so that their choices of the percentage of incentive pay could not be influenced by the choices of the other group members. For this procedure, the letters A through E were assigned to the five possible percentages of incentive pay.
The assignment of each letter to a percentage of incentive pay differed across subjects. Subjects informed the experimenter of their choice by referring to the letter, thus preventing the others from knowing the percentage of incentive pay selected. In addition, the five sets of variable expense cards were hidden from the subjects. The experimenter presented only the appropriate set of cards to subjects when they picked one preventing the other subjects from knowing what percentage of incentive pay the set of cards represented.
CHAPTER III

RESULTS

Data for the two 95%-85% groups (AB1 and AB2) are presented in Figures 1 and 2. All six subjects in these groups displayed preferences for lower percentages of incentive pay when monthly expenses were 95% of their monthly income in comparison to when monthly expenses were 85% of their monthly income. Subjects 1, 2, and 6 never chose a percentage higher than 50% during the 95% expense condition but frequently chose 75% incentive pay during the 85% expense condition. Similarly, Subject 5 selected 25% incentive pay for 21 of the 24 simulated months during the 95% expense condition but selected higher percentages for 19 of the simulated months during the 85% condition. The choices of Subject 3 were quite unstable during the 95% phase; however, preference for higher percentages of incentive pay during the 85% condition was still evident.

Data for the two 85%-95% groups (BA1 and BA2) are displayed in Figures 3 and 4. Subjects in these groups did not show marked preferences for lower percentages of incentive pay during the 95% expense condition in comparison to the 85% condition. Four of the subjects, Subjects 7, 8, 9, and 12 showed some tendency to select lower percentages during the 95% condition; however, their choices were very stable across both conditions. For example, Subject 8 selected 50% incentives for 18 of the 24 simulated months during both conditions, Subject 7 selected 50% incentives for 19 months during the 85% condition and 21 months during the 95% condition, Subject 9 selected 50% incentives for 18 months during the 85% condition and 20 months during the 95% condition, and Subject 12 selected
Figure 1. Percentage of Incentive Pay Selected by Subjects in Group AB1.
Figure 2. Percentage of Incentive Pay Selected by Subjects in Group AB2.
Figure 3. Percentage of Incentive Pay Selected by Subjects in Group BA1.
Figure 4. Percentage of Incentive Pay Selected by Subjects in Group BA2.
75% incentives for 20 months during the 95% condition and 18 months during the 85% condition. In contrast, Subjects 10 and 11 displayed slight tendencies to select higher percentages of incentives during the 95% expense condition than during the 85% expense condition, and their selections were more variable across both conditions.

Comparison of the data for the AB and BA groups suggests that subject choices were influenced by the order of exposure to the expense conditions. Subjects in the AB groups increased their percentage of incentives when first exposed to the 95% condition and then to 85% expense condition; however, subjects in the BA groups did not significantly decrease their percentage of incentive pay when first exposed to the 85% condition and then to the 95% condition. Subjects in the BA groups may have been reluctant to select lower percentages of incentives during the 95% expense condition after experiencing the higher earnings for higher incentive percentages during the 85% expense condition.

As indicated earlier, the experimenter suspected that the choices of the subjects may have been influenced by the choices of the other subjects in the group. In order to examine this possibility, another group was exposed to the 85%-95% (BA) condition using a modified procedure in which subjects could not determine the choices of the other group members. These data are presented in Figure 5. Similar to the subjects in the other BA groups, these subjects did not select lower percentages of incentive pay during the 95% expense condition after first being exposed to the 85% condition. Two of the three subjects, Subjects 13 and 14, showed some tendency to select higher percentages during the 95% expense condition, although these tendencies were not strong.

Due to the inconsistencies of the data for the AB and BA groups, two groups were exposed to a 95%-95% (AA) sequence in order to determine the effects of
Figure 5. Percentage of Incentive Pay Selected by Subjects in the Modified Procedure BA Group.
Figure 6. Percentage of Incentive Pay Selected by Subjects in Group AA1.
Figure 7. Percentage of Incentive Pay Selected by Subjects in Group A2.

Simulated Months

Subject 19
95% Expenses

Subject 20
95% Expenses

Subject 21
95% Expenses

Subject 19
95% Expenses

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

% Incentives Selected

% Incentives Selected
exposure to the 95% expense condition over time. The data for these subjects are displayed in Figures 6 and 7. The incentive percentages selected by three subjects, Subjects 17, 18, and 19 were comparable during both 95% expense conditions, although the choices of Subject 18 were considerably more variable during the second phase than during the first phase. Two subjects, Subjects 16 and 20, selected slightly higher incentive percentages during the second phase than during the first phase, while one subject, Subject 21, selected lower incentive percentages during the second 95% expense phase. These data suggest that subject choices of incentive percentages may vary after repeated exposure to the expense conditions and that some factor other than the expense conditions may have affected responding.

The results of the previous experimental sequences suggested that (1) the order of the presentation of the expense conditions could influence responding, and (2) that some factor other than the expense condition may have affected subject selection of the incentive percentages. In an effort to determine the extent to which these variables affected subject selection, an additional three groups of subjects were exposed to a 95%-85%-95% (ABA) sequence. In this sequence subjects were exposed both to the 95%-85% sequence and to the 85%-95% sequence. Further, this sequence permits an evaluation of whether changes in responding are due to the expense conditions or to other factors. Subjects were exposed to each expense phase for 16 simulated months.

Figures 8, 9, and 10 display the data for the three groups exposed to this 95%-85%-95% expense condition sequence. Four of the nine subjects, Subjects 25, 28, 29 and 30, selected higher incentive percentages during the 85% expense condition than during the 95% conditions. These data suggest that for these subjects the expense conditions were controlling the selection of incentive percentages. Further, responding was not affected by the sequence of conditions since these subjects
increased their incentive percentages when exposed to the 85% expense condition and decreased their incentive percentages when the 95% expense condition was reintroduced. The expense conditions also systematically controlled the responding of Subject 23, although this control was reflected by changes in the variability of responding rather than in the level of the incentive percentages selected. During the 85% expense condition, the subject showed a stable selection pattern, alternating between 25% incentives and 50% incentives. During both 95% expense conditions, responding was more variable.

The other four subjects displayed individualistic response patterns. Subject 27 selected higher percentages of incentives during the 85% expense condition. Based on the last seven simulated months of the 85% expense condition, one could maintain that the subject selected lower percentages of incentives during the final 95% expense condition indicating that responding was under the control of the expense conditions. On the other hand, one could just as reasonably argue that the selections were comparable given the lower percentages that were selected during the first part of the 85% expense condition. Subject 26 also selected higher percentages of incentives during the 85% expense condition than during the first 95% expense condition; however, this subject selected even higher incentive percentages during the final 95% expense condition. The data for these two subjects support the earlier suggestion that the order of exposure to the expense conditions may have affected responding. Similar to the subjects exposed to the 95%-85% sequence, these subjects selected higher percentages of incentive pay during the 85% expense condition and, similar to the subjects exposed to the 85%-95% sequence, they did not show marked preferences for lower percentages when the 95% condition was reintroduced.
Figure 8. Percentage of Incentive Pay Selected by Subject in Group ABA1.
Figure 9. Percentage of Incentive Pay Selected by Subjects in Group ABA2.
Figure 10. Percentage of Incentive Pay Selected by Subjects in Group ABA3.
Subject 24 selected comparable incentive percentages during the first 95% expense condition and the 85% incentive condition, but selected lower incentive percentages during the final 95% incentive condition. The choices of Subject 22 remained consistent across all of the expense conditions, indicating that the expense conditions did not affect responding.

In summary, five (Ss 23, 25, 28, 29, and 30), and possibly six (S 27), of the nine subjects exposed to the 95%-85%-95% expense sequence displayed sensitivity to the expense conditions. Five subjects selected higher percentages of incentives during the 85% expense condition while one (S 23) displayed more stable responding during this condition. One subject (S 26) selected higher percentages of incentives when exposed to the 85% expense condition; however, these preferences did not reverse when the 95% was reintroduced. Another subject (S 24) did not increase percentage of incentive when exposed to the 85% expenses, however, he/she did select lower percentage incentives when the 95% was introduced. The responding of the ninth subject (S 22) was not affected by the expense conditions.
CHAPTER IV

DISCUSSION

One major objective of the current study was to determine whether a simulation could be developed to study factors that affect worker preference for different types of pay systems. In the current study the percent of monthly expenses to monthly income was the independent variable. The dependent variable was subject selection of the percentage of their total pay that was incentive-based. Higher percentages of incentive pay resulted in higher potential earnings but also increased the variability of pay and the risk that subjects would not have enough money to pay monthly expenses. If subjects did not have enough money to pay their monthly expenses, a 20% interest was charged on the amount owed. It was expected that subjects would select lower percentages of incentive pay when their monthly expenses were 95% of their income than when their monthly expenses were 85% of their income.

The success of the simulation can be evaluated based on the extent to which the expense conditions controlled responding. Eighteen of the thirty subjects responded consistently to the expense conditions. Ten subjects (Ss 1-6, 25, 28, 29, and 30) responded as expected, selecting lower percentages of incentive pay when their expenses were higher, and three (Ss 17, 18, and 19) showed stable responding when sequentially exposed to two 95% expense conditions. Another four (Ss 7, 8, 9, and 12) displayed some tendency to respond as expected, and one subject (S 23) showed sensitivity to the expense conditions by decreasing the variability of selection during the 85% incentive condition.
Of the twelve subjects who did not respond consistently, seven (Ss 10, 11, 13, 14, 16, 20, and 26) increased their incentive percentages during the 95% expense condition following exposure to either the 85% expense condition or an initial 95% expense condition. One subject (S 22) selected comparable incentive percentages regardless of expense condition, indicating that the conditions did not control responding. Another subject (S 24) selected comparable incentive percentages during the first 95% condition and the 85% incentive condition, but selected lower incentive percentages during the final 95% incentive condition.

Comparison of the data for subjects exposed to the 95%-85% expense condition sequence with the data for subjects exposed to the 85%-95% sequences suggest that the order of exposure affected responding. This suggestion is further supported by the responding of two subjects (Ss 26, and 27) exposed to the 95%-85%-95% sequence. Therefore, the effects of the expense conditions may have been confounded by sequence effects.

The history of exposure to the expense conditions may also have affected responding. Three of the subjects exposed to the 95%-95% expense sequence displayed stable responding across both phases; however, three did not.

In spite of the fact that the order and history of exposure to the expense conditions may have influenced responding, the simulation appears to have been moderately successful in controlling responding. Further evidence of control by the expense conditions is suggested by a detailed analysis of subject responding. Thirteen subjects selected higher and higher incentive percentages within the expense phases. This trend is clearly illustrated by the responding of Subjects 19, 20 and 21 (see Figure 7). After subjects saved a certain amount of money, they gradually selected higher percentages. It was risky to choose high percentages at the beginning of each phase because of possible shortages. These early debts together with the
accrued interest could have resulted in irrecoverable financial trouble. In later months, savings could cover shortages. Therefore, these data imply that subjects preferred lower incentive percentages in high risk situations.

The response patterns of several other subjects also show sensitivity to the expense conditions. For example, Subject 17 (see Figure 6) selected low incentive percentages for three or four months then selected a high incentive percentage for one month. By doing this, she could avoid sizable debts that might have resulted from consistent selections of high percentages. Similar alternating response patterns were exhibited by Subjects 11, 14, 22, 23 (see Figures 4, 5 and 8). While these results do not indicate that subjects responded differentially to the expense conditions, they do suggest that the subjects were sensitive to the monthly expense manipulation.

Although subject responding appeared sensitive to the expense manipulation, it is not possible to determine the extent to which the results of the current study are representative of results that would be observed in a real work environment or were due to an imperfect simulation. There was one obvious aspect of the simulation that may have decreased the generality of the results: subjects were placed in a competitive situation. In each three-person group the subject who had saved the most amount of money at the end of the study received $5.00 and the subject who had saved the next highest amount received $3.00. This competitive contingency was introduced for motivational reasons. Results of a pilot study indicated that some subjects accumulated large debts. These data suggested that the simulation of financial demands was not sufficient to control responding. The competitive contingency was introduced to solve this problem and was effective in doing so. However, this competitive contingency may have produced behaviors that were different than those that would occur in a real work environment. Subjects displayed considerable interest in the incentive percentages selected by other group members.
and the amount of their savings, factors that influenced the outcome of the competition. As indicated earlier, seven subjects of the twelve subjects who responded inconsistently to the expense manipulations increased their incentive percentages during the 95% condition following exposure to the 85% expense condition or an initial 95% expense condition. Because higher incentive percentages had higher potential payoffs, subjects who had not saved as much money as other group members may have attempted to win the competition by selecting higher percentages toward the end of the study. The competitive contingency, thus, may have controlled responding more than the simulated monthly expenses. Financial requirements would be expected to exert more control over the behavior of actual workers. Perhaps the use of play money or real money with a reduction of the salary and financial expenses would enhance the control of the financial requirements in a simulation.

Some of the between-subject differences may have been due to the nature of the simulated work task. Performance was simulated by the roll of the die and thus could not be controlled by the subjects. The numbers rolled on the die may certainly have influenced subsequent incentive percentage selections. For example, rolls of 6s (representing above-average performance) may have encouraged subjects to select high percentages of incentive pay while rolls of 1s (representing below-average performance) may have prompted subjects to select low percentages of incentive pay. Further, if high rolls occurred at the beginning of the phase and subjects had selected high percentages of incentive pay, they would have been able to accumulate enough money to cover any debts that may have occurred in future months. Therefore, the risk of selecting high incentive percentages would have been decreased. The reverse would have been true if low rolls occurred at the beginning of the phase.
The between-subject differences may be representative of the differences that would be observed for workers whose performance is also not, to a large degree, under their control. Performance of some types of work is strongly influenced by factors outside of the workers' control and while these factors exist to some degree in all jobs, they are more prominent in certain jobs than in others. For example, although a keypuncher's productivity is dependent upon the condition of the keypunch machine, the amount of work there is to do, the quality of the keypunch cards (which can influence jamming), etc., the output variability due to such factors would be expected to be relatively small in comparison to the variability due to factors under the control of the employee such as time on task, skill, and physical condition. On the other hand, the performance of an in-house sales representative would depend considerably on the number of customers who enter the store, the general economy and the price and quality of the product being offered in comparison to a competitor's product. Workers who have little control over their productivity would be subject to the same type of performance fluctuations and uncertainties as the participants in the current study.

If workers have more control over their performance, their performance may vary less and thus they may prefer higher percentages of incentive pay. Therefore, higher and more stable selections of incentive percentages may result. Further, if performance was highly stable and higher percentages of incentives resulted in higher earnings, workers should logically select high incentive percentages irrespective of the percentage of expenses. Future research should address the extent to which control over work influences worker preference for the percentage of incentive pay to base pay.

Some of the observed between-subject variability may also have resulted from individual differences with respect to risky situations, differences that would affect
real workers as well as the subjects in this study. The extent to which an individual is willing to trade-off lower guaranteed pay for risky higher pay depends in part on the individual's history and experience with this and other types of situations involving risk. Fairly strong individual differences would be expected in what could be called "attitude toward risk" and this might well affect an individual's preference for the percentage of incentive pay under different expense conditions.

In summary, the current simulation was moderately effective in controlling subject responding. The majority of subjects displayed sensitivity to the expense manipulation and eighteen of thirty subjects responded consistently to systematic manipulations of the expense conditions. The results of this study, therefore, suggest that it may be possible to use simulation research to examine factors that affect worker preference for different types of pay systems. However, response sensitivity and consistency, while necessary, are not sufficient to consider a simulation a success. The results obtained must resemble the results that would be obtained if the study were conducted in the real environment. The generality of the results were not assessed in the current study. Nonetheless, the fact that the independent variable controlled responding for the majority of subjects is encouraging. Given the difficulty of conducting this type of research in a real work setting, future research should continue to assess the feasibility and generality of simulations.
Appendix A

Western Michigan University's
Human Subjects Institutional Review Board Approval
TO: Shezeen Oah
    Alyce Dickinson

FROM: Ellen Page-Robin, Chair

RE: Research Protocol

DATE: September 10, 1986

This letter will serve as confirmation that your research protocol "The effects of monthly expenses on a worker choice of the percentage of incentive pay to base pay: A simulation" has been approved at no more than minimal risk at the September 10 meeting of the HSIRB.

Upon analysis, it appears that this protocol could have been entered under expedited or exempt.

We need the investigator's signature on the original protocol. Please come in and tend to this matter as soon as possible!

If you have any questions, please contact me at 383-4917.
Appendix B

Informed Consent Form
Dear students:

I have identified college students whose average age is 21 as the subjects in my investigation. I am going to investigate the effect of the monthly expenses on the worker's choice of the percentage of incentive pay to total pay. I'd like to find out whether there is a relationship between the worker's choice and his monthly expenses.

If you participate in this study as a subject, you will work in a simulated work situation by rolling a die. You will be required to listen to an instruction and roll the die. Every rolling of the die will simulate one week's performance and you will be paid weekly pay which is determined by the number on the face of the die with play money. After your rollings of the die, the experimenter will show you your monthly fixed expenses, make you pick up cards which contain several variable expenses in order to decide your variable expenses in a month and give you a chance to choose the percentage of incentive pay. This procedure will be repeated a maximum of 48 times. It will take approximately 1 hour.

There is no risk to you at all and any information obtained in this study will remain confidential. In the case of publication and presentation, the number which designates a particular subject instead of the subject's name will be used in the data display.

Participation is voluntary and you can quit at any time during the experiment.

If you have any question or something to discuss about this study, you may contact me at 344-8472.
Your signature below indicates that you understand the above information and have decided to participate.

Signature ____________________ Date ____________ Time ______________

Signature of Investigator
APPENDIX C

Written Instructions to Subjects
Instructions to Subjects

Assume you are working in an organization and receive your pay every week. This weekly pay consists of base pay and incentive pay that can be earned when you perform above standard. In other words, you receive a certain amount of base pay regardless of your performance, but your incentive pay is determined by how well you perform.

Your task in this experiment will be to choose the percentage of incentive pay that you like. You can choose any percentage of incentive pay from 0% to 100%. As the percentage of incentive pay increases, so does the amount that you can earn in a week. However, if you perform poorly, then you earn less money as the percentage of incentive pay increases.

Your work performance will be simulated by rolling this die. One roll of the die will simulate one week of work. Each time you roll the die, I will give you your weekly base pay regardless of the number that shows on the face of the die. In other words, this is the pay you get no matter how well or poorly you perform. The number on the face of the die will simulate how well you performed that week, and hence determine how much incentive pay you receive. The number 1 represents poor performance. The numbers 2, 3, 4, and 5 represent medium performance. And the number 6 represents excellent performance.

Table 1 shows the total amount of pay you can earn depending upon the percentage of incentive pay that you choose, and also shows the amount of incentives that can be earned based on the roll of the die. Feel free to look at this table as frequently as you would like at any time during this study. From this table, you can see that if you select 25% incentive pay, then the total possible you could earn would be $300. That is, if you rolled 6 you would earn $180 base pay and $120 incentive
pay for a total of $300. The least amount you could earn would be $180. That is, if you rolled a 1 you would earn $180 base pay and $0 incentive pay for a total of $180. Now let's look at 100% incentive pay. If you select 100% incentive pay - you could earn a lot more money if you roll a 6: $540 rather than $300. However, if you roll a 1, you would earn a lot less money when compared to the 25% incentive pay condition - you would earn no money. Do you have any questions about this Table?

After each roll of the die I will pay you the amount that you have earned. Remember, each roll of the die represents one week. After you have rolled the die four times, you will have to pay your monthly bills. I will give you a list of your fixed expenses - these will remain exactly the same until I give you a new list. In addition, you will draw one of these cards to determine additional expenses (such as money spent for car repairs, clothing, entertainment, etc.). These expenses will vary from month to month. Your total monthly expenses will be added up, and you will pay these expenses out of your earnings.

After paying these expenses, you may adjust the percentage of incentive pay for the following month. You may choose any percentage between 0% and 100%. I will ask you to write your choice on a piece of paper, which you will give to me.

This procedure will be repeated several times so you will have several chances to adjust the percentage of incentive pay you will receive.

Before we begin, let's practice this procedure for two simulated months. We will assume for now that the percentage of incentive is 25%. Do you have any questions before we begin?
Appendix D

Verbal Instructions to Subjects
Verbal Instructions to Subjects

Suppose you work in an organization and receive your pay every week. This weekly pay consists of base pay and incentive pay. Incentive pay will be determined by your performance, but you receive a certain amount of base pay regardless of your performance except in the case of a 100% incentive payment system. If the payment system contains a high percentage of incentive pay, you can earn more money in the case of good performance, but you may earn less money in the case of poor performance. Under a lower percentage of incentive pay, you will assure more money if your performance is poor, but will earn less money for good performance. In this experiment, you have to choose the percentage of incentive pay you prefer. One rolling of the die represents your performance for a week and determines your weekly earnings. That is, the number 1 and 6 will simulate poor and excellent performance, respectively. And the numbers 2, 3, 4, 5 will simulate medium performance. You can see the relationship between the total amount of weekly and monthly pay and the percentage of incentive pay according to the face showing on the die in Table 1.

The experimenter provided the subjects with several specific examples from Table 1 after these instructions were given.

After four rollings of the die (after your monthly income is determined), you will be provided with the list of details of monthly fixed expenses, the opportunity to pick up a card in order to determine the content and amount of monthly variable expenses, and the chance to choose the percentage of incentive pay for the next month. This procedure will be repeated several
times, which means you will have several chances to choose the percentage of incentive pay over several months. Fixed expenses consist of expenses you should pay every month on a regular basis such as expenses for apartment rental or food. I will give you a list of your fixed expenses every month and these will remain exactly the same until I give you a new list. Variable expenses consist of expenses you might not have to pay every month but pay on an irregular basis such as expenses for fixing your car or a doctor’s bill. You will have five different sets of cards containing different amounts of variable expenses. You should pick up one of the cards from the set matched to the percentage condition you choose in order to determine your variable expenses. When you choose a higher percentage of incentive pay, the average amount of these variable expenses is higher than when you choose a lower percentage. However, the fixed expenses will be held constant until the experimenter gives you an additional instruction.

After your monthly income and expenses are determined, the experimenter will subtract the amount of monthly expenses from the monthly income. If your monthly income is greater than monthly expenses, you can save the difference. However, if monthly income is less than monthly expenses, you should pay the difference to me. If you have enough money saved, you can deduct that amount from your savings. But if you have not saved enough money, it will be simulated that you should borrow money from someone with an interest of 20%. This means that you should pay an additional 20% of your shortage next month.

What you have to do is save as much money as possible. I will count all of your money at the end of this experiment. Whoever who has the most
money will be paid $5.00, the person with the second-highest total paid $3.00, and no money will be given to the person saving the least money.

After these general instructions, the subjects were given additional instructions specific to each group. The subjects in the AB groups were told:
For the first 24 months your average amount of monthly expenses will be 95% of monthly income. Your monthly expenses will be a different percentage of monthly income for the next 24 months. At the beginning of the second months, you will have no money.

After they finished the first 24 months, they were told: From now on, the average amount of monthly expenses will be 85% of your monthly income. All other procedures will be the same as in the first 24 months.

Subjects in the BA and AA groups were given the same instructions except the sequence of monthly expenses was changed

Subjects in the ABA groups received the following instructions: For the first 16 months, your average amount of monthly expenses will be 95% of monthly income. Your monthly expenses will be differing percentages of monthly income for the next two 16 month periods. At the beginning of the second and third 16 months, you will start without any saved money.

After they finished the second 16 months, they were told: From now on, your monthly expenses will be approximately 95% of your monthly income.
BIBLIOGRAPHY


