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The Role of Performance and Gender in Hiring Decisions

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The Role of Performance and Gender in Hiring Decisions

By

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An Abstract of a Thesis
in
Applied Economics

Submitted in Partial Fulfillment
Of the Requirements
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State University of New York
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ABSTRACT OF THESIS

Gender is likely the first trait a person will notice when meeting someone new. Typically, there isn't much thought behind it when it is observed. There is just a basic understanding that this new individual is either male or female. Every characteristic going forward is built on that building block of gender. What if this first observation has a much deeper effect on the outcomes going forward than just knowing someone is male or female? What if it changes the entire relationship structure going forward? This thesis will discuss findings on a gender, negotiation, and risk preferences. These findings are from an experiment that was directed solely for this thesis. We will analyze the outcomes of the experiment and speak to the effects those outcomes have on currently established theories.

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CHAPTER ONE:
INTRODUCTION

> "Woman seems to differ from man in mental disposition, chiefly in her greater tenderness and less selfishness; and this holds good even with savages… Man is the rival of other men; he delights in competition and this leads to ambition which passes too easily into selfness… with woman the powers of intuition, of rapid perception and perhaps of imitation, are more strongly marked the man; but some, at least, of these faculties are characteristic of the lower races, and therefore of a past and lower state of civilization" (Darwin, 1874 pp. 563-564)

This is a quote from Charles Darwin's The Descent of Man: And Selection in Relation to Sex article. It discusses the idea that men and women, in the most basic sense, are naturally different beings in their mental dispositions. Charles Darwin is considered by many to be the "father" of evolutionary thought. He is famous for his contributions to the science of evolution. Darwin made the discovery that all species of animals descended from the same common ancestors. He spent his life researching how species' characteristics change from one generation to the next. To be able to do this accurately, Darwin would have had to establish the building blocks first. For example, he wouldn't have been able to tell that a sparrow's beak had evolved or changed from the generation prior it if he didn't thoroughly understand the first generations beak structure. In the quote above, he discusses the different mental states that men and women come from and how that affects them. Man, comes from a place of competition and rivalry in the world around him. Woman, however, comes from the mindset of tenderness, compassion, and power intuition in the world around her. An evolutionary scientist from the 1800's made these distinctions long before gender preferences became a topic in the experimental world. Since the beginning of the millennium, there has been a large uptick in the amount of experimental work done on gender difference and preferences. (Niederle, 2014 pp. 3) So why did Darwin make this observation long before gender difference was a commonly discussed scientific topic? One reason could be because gender preferences and differences have such a profound effect on the world. Darwin's comment is something that is widely accepted in society, women are known as care givers and men are the competitive individuals that rival others to provide for themselves and their families. While this is a known fact in society, and ingrained into individuals as children, what if this has a more profound effect that currently realized? What if this kind of automatic thinking causes more harm than good?

These types of questions drove this thesis the first place. There are many situations in life where both men and women are bucketed into these blanket categories and it makes a person wonder what the repercussions to this behavior are. Most undergraduate students in an economics major take a class based around the economics of the labor market. Typically, in this discipline the pay gap for male and female workers is discussed in detail. So, while two employees of different genders are performing the exact same jobs their pay is different. Why is this so? If you have two people completing the exact same tasks why would anatomy come into play? This thesis was born from that question. We will not be able to answer completely why the pay gap exists but, hopefully, we can bring more understanding and knowledge to the overall issue.

The question that started this thesis was an easy one to come by but how to go above solving this puzzle will be a little more difficult. An experimental approach was chosen because it is critical to capture the actual interaction between a manager and a worker to be able to get to the core of this issue. A worker's pay typically starts with the manager that interviews them for the job. Since the first interaction an individual has with a manager greatly affects their pay it is quintessential for this thesis to be able to capture that interaction. If this interaction is better understood it could explain why a pay gap exists or at least could show the differences in men and women's behavior during this situation. The best way to learn more about this interaction is to duplicate it and see what the results yield. The way to accomplish that goal is to design an experiment and duplicate it numerous times in a lab. This analysis would shed light onto the question of whether or not gender plays a role in hiring decisions.

While designing the experiment, research into other experiments that have already been published brought to light the factor of productivity into the hiring decision. To measure productivity, Price (2012) had subjects solve math problems in an effort to measure the impact of productivity on compensation choice. Adding the element of productivity will allow the experiment to closely mirror reality. When an individual goes to a job interview at a company, they typically bring a resume, which is some signal of their productivity over their career. A manager has that information when they make the hiring and salary decision, so to be able to reflect that facet of reality in the experiment makes it more thorough and complete. The more thorough the experiment the more reliable the data gathered from it. It was important while designing this experiment to keep it as close to reality as possible. If the question of ‘Does gender play a role in hiring decisions?’ is to be answered, the experiment needs to be as close to reality as possible.

When analyzing the interaction of a possible employee and a manager for the first time, an element of risk is also involved. Risk comes into play in two forms, from both the possible employee’s perspective, and the manager’s perspective. The possible employee has the risk of saying or doing something that would discourage the manager from hiring them. This type of interaction could be something as simple as discussing vacation time and the manager getting the feeling this wouldn’t be a dedicated worker. This type of interaction, discussion about benefits or the job criteria was not an element built into the design of the experiment. If the possible employee is more of a risk taker, they might not be as worried to bring up vacation time or try to negotiate a higher salary than someone who is more risk adverse. To be able to capture this facet of the individuals, the experiment had a built-in risk questionnaire that all participants took in the beginning. The manager’s risk preferences were also captured so it gives the insight to how risk affects the overall this strategic interaction.

When attempting to answer the question of the effect of gender on hiring decisions, it is imperative to look at the question from all angles. It is possible that gender might affect the hiring decision, so to add more elements to the experiment was very important. This is why performance and risk preferences were also captured. While attempting to research if gender is a large factor or not in hiring, the experiment was also built to capture other aspects that might give insight into the strategic interaction. It was important that while designing the experiment, it wasn't skewed in design by my belief that there would be a large effect of gender on hiring decisions.

When Darwin wrote about the differences in male and female mental dispositions, he wasn't only referring to employees and managers but men and women in their overall approaches to life. He discusses how women are more caring and selfless than their male counter parts. If that holds true, does that mean a woman would be more concerned about helping others and giving care, therefore causing women to be more risk adverse so that the people around them are safer? Are men more risk loving since they are more competition driven and ambitious? Does their ambition cause them to worry less about risks and more about the rewards of their actions? These questions are ones that will not be answered without a shadow of a doubt in this thesis. However, the data collected in the experiment could shed light onto some of these questions and give more insight into the mental dispositions of males and females.

> "The theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method, rather than a doctrine. An apparatus of the mind, a technique of thinking, which helps its possessors to draw correct conclusions." (Keynes 1936)

John Maynard Keynes writes this passage in his work *The General Theory of Employment, Interest and Money* in 1936. Keynes speaks of how economics is a method rather than a doctrine. It is a social science that gives the ability to learn about individuals' actions, drivers, incentives, and much more. To be able to answer questions like, 'How does gender affect hiring decisions?' there must be a way to unlock, or at least gain insight into the reason human beings make the decisions they do. Economics gives us that ability. It helps its possessors to draw correct conclusions as Keynes wrote. This thesis aims to give insight into the effects of gender, risk, and productivity into the interaction of employees and managers. It does not hope to fully answer the question, but will attempt to draw correct conclusions on how human beings make decisions. That is all economics can really hope to do.

CHAPTER TWO:
LITERATURE REVIEW

> "Men and women differ in their emotional reaction to uncertain situations and this differential emotional reaction results in differences in risk taking. Emotions affect the evaluation of outcomes as well as the evaluation of probabilities. However emotions are not the only reason for gender differences in risk preferences. Men are also more confident than women and, as a result, may have a different perception of the probability distribution underlying a given risk. Men also tend to view risky situations as challenges, as opposed to threats, which leads to increased risk tolerance. " (Croson and Gneezy 2009 pp. 7-8)

In 2009, Corson from the University of Texas Dallas and Gneezy from the University of California, San Diego, published a work that reviewed the literature on gender differences in economic experiments. This paper mainly focused on three main areas: risk preferences, social preferences, and competitive preferences. This work was chosen as part of this thesis' literature review because the main sources of information used in the paper were economic experiments. This allows for a good reference point to compare different types of experiments and their outcomes. The first risk related experiments analyzed in the paper are objective probability lotteries. So, these experiments have known probabilities and known dollar outcomes. The paper used a table to show outcomes of many of these experiments. Below is Figure 2.1, the table of outcomes for objective probability lotteries.[1]

[1] The robust finding is that men are more risk prone than are women. Previous surveys of economics (Catherine C. Eckel and Philip J. Grossman 2008c) and psychology (James P. Byrnes, David C. Miller, and William D. Schafer 1999) report the same conclusions: women are more risk averse than men in the vast majority of environments and tasks. This table (and future tables as well) also note whether the authors included controls other than gender in their analyses (e.g., year in school, age, major, country of origin, race, etc.). The inclusion of controls, and exactly which were included, varies by paper.

Figure 2.1 Table of Outcomes for Objective Probability Lotteries

TABLE 1

	Experimental details	Pay	Gain/ loss	Summary	Risk taking	Controls included?
Holt and Laury (2002)	Students	Yes	Gain	Choice between lotteries according to mean–variance. Varied also the level of pay	Low payoffs: M > F High payoffs: M = F	Yes
Hartog, Ferrer-I-Carbonell, and Jonker (2002)	Mail survey and Dutch newspaper	No	Gain	Willingness to pay for high-stakes lotteries. Gender difference in risk aversion parameter is estimated at 10 to 30 percent	M > F	Yes
Dohmen et al. (2005)	Rep. sample of German population and students	real and hyp	Both	Survey instrument is validated in experiments. Survey questions predicted behavior well	M > F	Yes
Powell and Ansic (1997)	Students	Yes	Both	Choice of insurance cover in one treatment and an unfamiliar financial decision about gains in another	M > F	No
Eckel and Grossman (2002a)	Students	Yes	Both	Choice between lotteries according to mean–variance. Frame (gain/ loss) changed between treatment	M > F	Yes
Eckel and Grossman (2002b)	Students	Yes	Both	Choice between lotteries according to mean–variance. Lotteries and investment frames with the possibility of loss, and a lottery frame with no loss	M > F	Yes
Fehr-Duda, Gennaro, and Schubert (2006)	Students	Yes	Both	Gender differences depend on the size of the probabilities for the lotteries' larger outcomes	M > F	Yes
Levin, Snyder, and Chapman (1988)	Students	No	Both	Half of the subjects were given the "chance of winning" each gamble, and half were given the "chance of losing" each lottery	M > F	No
Finucane et al. (2000)	Phone survey	No	Both	Ethnically diverse group of participants. White males were more risk taking than all other groups	M > F	Yes
Schubert et al. (1999)	Students	Yes	Both	Choice between certain payoffs and lotteries in abstract and contextual frames	Gains: M > F Losses: M > F Contextual: M = F	No

What is so insightful about this table is the overwhelming finding that men are more risk loving than women. They are experiments from a large time frame. The earliest experiment was performed in 1988 and the latest in 2006. This is an interesting observation because it shows that for the span of almost 20 years these objective probability lotteries have mostly yielded that males are greater risk takers than women. This shows that even over a large time span there clearly consistency in these types of experiments that males are less risk adverse than females. While this is not shocking from a culture perspective, because this is the accepted social norm, it puts real data behind its largely accepted social belief. There is something to be said about experiments that can be duplicated over and over and still yield the same results. It makes the data derived from these experiments less controversial because it has been duplicated multiple times and the outcomes remain relatively the same.

Another piece of evidence that supports this table being relevant is the subjects. In the second column of the table, it denotes where the subject pool was for each experiment. The subjects have a large range of where they originated, some are students, and others were simply phone surveys while some were from a Dutch newspaper mail in directive. This is a helpful factor in this article's creditability because it shows variation in the selection pool. One critique of experimental economics is that the subjects have the potential of giving skewed results since they typically came from one university and may not be representative of the population. However, as the table shows the subjects were from varying backgrounds and the outcomes were still the same, males being more risk loving than females. It is much harder to dismiss the results of these experiments when they all have similar outcomes as well as a diverse population of subjects.

After the article clearly shows that there is a gender difference in risk taking, it offers explanations as to why this could be the case. The first explanation is a difference in emotional reactions in risky situations. As humans, we have fast instinctive and intuitive reactions to risk.[2] These "fast" reactions are a lot of the time better indicators or predictors of what we as individuals will do when a risky decision is put in front of us. The article goes on to say that this type of framework is absolutely crucial in being able to understand the gender differences in the realm of risk preferences. There is research that shows that women experience emotions more strongly than their male counterparts.[3]

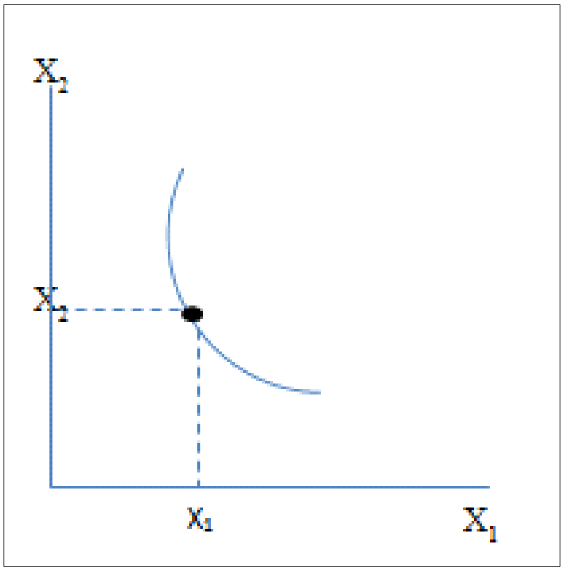
If that is correct, and women truly are more emotional about these risky situations than men, it changes the utility of the risks they face. So, in other words, women could have more to lose than males in these instances. For example, if a man and woman are both faced with known dollar investment and the known risk of the invest, for instance a 50% probability of default, the female might be more negatively affected if the investment goes poorly since she has a different indifference curve than the male regarding her utility. An indifference curve, represented in Figure 2.2, is a curve on a graph that represents two goods or commodities that represent one level of utility along the whole curve (Varian, 2010 pp. 36-37). So as an individual moves up and down the curve, they trade one level of good A, for good B, while still representing the same amount of utility.

For example, if good A is coffee and good B is donuts, on a given indifference curve for these products an individual can give up a certain amount of coffee and in return receive a certain number of donuts. Or vice versa if they want

[2] George F. Loewenstien et al. (2001) develops what is called "risk as feelings" see also the discussion of the "affect heuristic in Paul Slovic et al (2002)
[3] See the review in R.A. Harshman and A. Paivio 1987

more coffee they would have to give up more donuts to get that additional level of coffee.

Figure 2.2 Indifference Curve

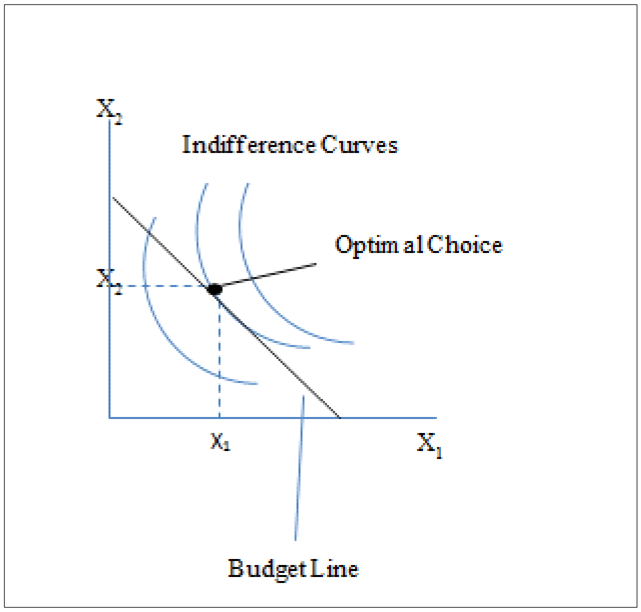


What they cannot do is chose to have more donuts and more coffee at the same time. The issue with this decision is it would, in theory, cause the individual to get a higher level of utility and if that is the case they would change indifference curves all together. To change indifference curves, the individual would have to "do" something to make this adjustment. Commonly this action is paying more money. So, in the coffee and donuts example, if the individual wanted more of both goods, they would have to pay over all to get this new level of utility. The amount of money of the new indifference curve will be greater than the original indifference curve because the amount of both goods increased overall.

When thinking about this, one question that might arise is, “Why would anyone person pick to stay on a lower indifference curve? Wouldn’t they just keep moving up?” These questions make sense; typically, individuals would always say more is better. More money is deemed better than less money. It’s always better to have more food than less. This is also how our culture treats consumption. The more an individual can consume whether its clothes, cars, houses, the better off they are viewed to be. The issue with the “more is better than less” idea is, while it is true that people want to consume a lot, they cannot always feasibly do that. What stops the majority of individuals from buying three houses and five cars is a budget constraint.

A budget constraint is exactly like it sounds; it is an amount of money, or income, which constrains an individual’s choice. The amount of money a person brings in every month, whether it is income from their job or aid from the government, is what defines the budget constraint. Once this amount is established, it can then be plotted on the same graph (Figure 2.3) at the indifference curve and that is how a specific indifference curve is decided upon (Varian, 2010 pp. 73-74).

Figure 2.3 Budget Constraint Line and Indifference Curve

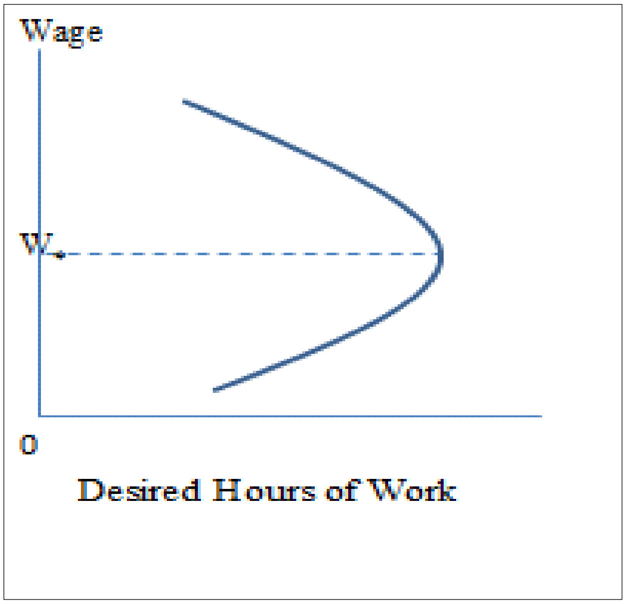


So, when discussing the coffee and donuts example, the budget constraint is what ultimately sets the indifference curves an individual has to pick from. If there is an indifference curve above the budget constraint line, like in figure 2.3, an individual cannot be on that curve because it costs more than they can afford. A person can however pick a lower indifference curve than the one tangent to the budget constraint. It is not optimal for a person to pick a lower indifference curve because they would be getting a lower level of utility. As stated in the graph above, it is optimal for an individual's indifference curve to be tangent to their budget line because it gives them the highest level of utility given their income level.

Another key point, is that savings is already built into the budget constraint line. The budget constraint is derived from the amount of income a person makes, but when their savings level is factored in the budget constraint line it is more reflective of disposable income. It is the amount of money an individual has to spend on the two goods in the graph. So, in the example of coffee and donuts the budget constraint could be the amount of money this individual budgeted for coffee and donuts. That is not to say the budget constraint line in the coffee and donuts graph is the total income the person makes, but rather the amount of income the person desires to spend on coffee and donuts.

When discussing indifference curves in the realm of labor supply the graph will change from the traditional indifference curve graphs as shown above to the graph shown below. Figure 2.4 shows what is referred to as the *backward-bending* labor supply curve (Ehrenberg and Smith, 2014 pp. 174-176).

Figure 2.4 Backward-bending Labor Supply Curve



The graph shows that when wage goes up an individual's desired hours of labor increases as well however, this only holds true if the wage is below w^*. If an individual's wage is above w^* a further increase in wage would actually result in the decrease of hours worked. In other words, as an individual makes more money there is a point where they would rather work less when the pay increases, this is when the income effect dominates. The income effect is "as income increases, holding wages constant, desired hours of work will go down" (Ehrenberg and Smith, 2014 pp. 171). When an individual is below w^* point on the graph they will work more as their wages increase, this is when the substitution effect dominates. The substitution effect is defined as the following "as income is held constant, an increase in the wage rate will raise the price and reduce the demand for leisure, thereby increasing work incentives" (Ehrenberg and Smith, 2014 pp. 172).

The backward-bending labor supply curve is different from the normal indifference curve because there is not always a simple one to one trade off. For example, in the normal indifference curve as you increase the good consumed on the y-axis the good consumed on the x-axis will have to decrease however, this is not always true in the backward-bending curve. There are times in the backward-bending curve that as the y-axis, or wage, increases so does the x-axis, or desired hours worked. It all depends on what level of wage an individual's starts out at on the backward-bending curve. So, as stated previously on a normal indifference curve if an individual wants more of one good they have to give up another to attain that, but this is not the case in backward-bending. So, it is important to remember that when speaking about indifference curves understanding the two goods or commodities being analyzed are essential to being able to pick the correct depiction of the graph.

So, when R.A. Harshman and A. Paivio[4] stated that women experience emotions more strongly than their male counterparts, would that change their indifference curves surrounding risk? The article points out that women are more emotional about risky decisions. One could easily argue that a woman could gain more utility by making less risky decisions because risk causing a greater emotional response than playing it safe.

The following article sheds more light this theory "Gender, Competition, and Managerial Decisions" by Curtis R. Price 2012.

> "The purpose of this study is to investigate the use of competitive compensation between a manager and a worker in the laboratory. To this end, we impose a simple agency relationship between two groups of subjects termed managers and workers. The manager chooses a compensation scheme for the worker from either a piece rate or a tournament payment scheme and is paid based on the workers performance in the task. The results indicate that when given information about worker ability, male managers choose the tournament significantly less often for a female worker. On the other hand, when no information about worker ability is given to the manager, there is no difference in compensation choice for the worker, although male and female managers differ significantly in their own preferences for compensation scheme. We conjecture that these results are tied to the fact that there is a measurable stereotype that females are worse at the task relative to males, although further research is needed in this regard." (Price 2012 pp. 114)

The above paragraph is the abstract of the article and provides an overview of what the experiment was about. It focuses on how gender plays a large role in how individuals approach competitive situations. This article was selected as research for this thesis because it provides insight into the validity behind men and women acting differently when faced with competitive environments.

[4] See the review in R.A. Harshman and A. Paivio 1987

This experiment was conducted in an experimental economics laboratory located on a college campus[5]. The individuals who volunteered for this experiment were paid for their involvement, however, they were not all paid equally. The amount of payment was based upon their decisions in the experiment itself. This is an important point to bring up because it brings a facet of reality into the experiment. The individuals will have more of a vested interest in the experiment if the outcomes of their decisions have consequences. For example, if an individual knew they would receive the same amount of money no matter what decisions they made during the experiment they would not be incentivized to pay attention to their actions. Adding the level of payment based upon people's actions gives individuals incentives to be more engaged and make decisions that more closely reflect reality.

The experiment itself consisted of four tasks that the participants had to complete. At the end of the experiment one of the four tasks was selected at random and the subjects were paid based on their performance in that task. The instructions for each task were read aloud to all participants before each task was started. The first task was called the "piece rate" task, which consisted of all participants adding up five two-digit numbers for five minutes. For every set of five two-digit numbers they got right the subjects earned $0.75. The second task, the tournament, the participant's number of correct answers in task one was compared to the number of correct answers in task one from a random participant from a previous session of the experiment. If the individual solved more problems correctly, than the random

[5] Subjects were recruited from the population at Purdue University using the normal protocols at the Vernon Smith Experimental Economics Laboratory.

participant they would be paid $1.50 per correct problem; however, if the individual solved less than the random participant the individual would be paid $0 for the task. In the case where the individual and the random participant answered the same amount of problems correctly, there would be a 50% chance of either getting paid $1.50 per correct problem or nothing.

The third task was the “manger’s choice” where the participants are told they are paired with the individual sitting next to them. They then select a payment scheme for the other individual. The options for the payment schemes or either the piece rate or the tournament. After both people in the pair have made their decision, the computer program used in this experiment then randomly selects one person in the pair to be the manger and one to be the worker.

This was completely random and both people in the pair had a 50% chance of being the manger and a 50% chance of being the worker. The person who has randomly been chosen to be the manager then has their choice enforced and the worker is made aware of what payment scheme has been selected for them. The individual who has been selected to be worker then has to solve addition problems consisting of five two-digit numbers in a five-minute time frame (the exact same as in task one). Only the worker solves problems. Once the five minutes is up, the manger earns $1 for every problem the worker got correct. The worker is paid based upon which payment scheme the manager picked for them in the beginning of task 3.

The fourth task is called “individual choice” where participants pick a payment scheme for themselves. They can pick between the piece rate or the tournament. After the fourth task was completed, the experiment was over and the director of the experiment would randomly select one of the four tasks for payment. Whichever task was chosen would determine how all of the participants in the experiment were paid.

The main outcome observed from this experiment was that when a male is selected in the manager role they will choose the tournament payment scheme far less often for a female worker than a male worker.

> "The fact that a worker's gender is an important aspect of the choice of compensation scheme suggests that some perceived information about the worker's ability is contained within their gender. If a manager with a female worker believes (a priori) that females are not as able at the task and the data she is presented confirms, or at least does not conflict with, this belief, she would surely be less likely to choose the tournament for the worker." (Price 2012 pp. 120)

The above quote brings up a potential explanation of why a male manager is more likely to choose the tournament for a male worker and not for a female worker. The explanation is based around the idea that a worker's gender brings about some perceived information about how the worker will perform. So, male managers might pick the tournament pay scheme less often for females because in the tournament if a manager's worker solves less correct problems than the random participant they are pegged against no money is made for the manager or the worker. Since a male manager picks the tournament scheme more often for a male worker, it stands to reason that these managers have some belief that the male worker will perform better than the random participant they are pegged against. On the other side of that coin, they pick the tournament less often for the females because they have some belief that they would not perform as well against a random participant. This is just a potential explanation of the data set this experiment provided.

Whether it be in risk preferences or perceived abilities of workers, there seems to be substantial evidence pointing to the fact that gender does play a role in human beings' decision making habits. Reviewing the published literature about gender differences in both risk preferences and managerial decisions aided in correctly analyzing the data that came from this thesis' experiment. Reading and analyzing what has already been done in this arena allows for a larger understanding of the overall picture of how gender plays a role in everyday life. The next sections will explanation the methodology behind the experiment that was performed to inform the question this thesis is asking.

CHAPTER THREE: METHODS

The subjects that participated in the experiment were recruited from the student population of Purdue University. These participants were enlisted using the standard recruitment protocols employed at the Vernon Smith Experimental Economics Laboratory[6]. The subjects sign up to participate in the experiment only knowing that the session is scheduled to last about one hour and that it is an economics experiment. When the participants arrive at the laboratory, they are asked to sign in on a sign in sheet at the front of the laboratory. After signing in, they are directed to a seat by an experimenter. The subjects are seated with an individual directly next to them. The two participants are at separate workstations which both are equipped with computers. Partition walls separate the workstations. Each group of subjects is separated from another group by an empty computer terminal. This set up is designed specifically so that individuals cannot interact during the experiment but can still observe, casually, the gender of their group mate. Each participant was provided with a risk questionnaire, as well as, a pencil and blank white piece of paper at their workstation. At no point during the experiment was the topic of gender mentioned.

The subjects were directed to fill out the risk questionnaire once all the subjects had been seated and the laboratory doors had been closed. The risk questionnaire[7] had 15 decision points the subjects had to fill out. The subjects had

[6] The protocols for recruiting subjects at the Vernon Smith Experimental Laboratory (VSEEL) are available under the heading "PARTICIPATE" on the VSEEL webpage: http://www.krannert.purdue.edu/centers/vseel/index.htm.
[7] A full copy of the risk questionnaire is provided in the appendix of this thesis.

the option of choosing either A or B on each decision point. Below is a section of the risk questionnaire that was provided to the subjects.

Figure 3.1 Subject Risk Preference Questionnaire

Participant ID __________

Decision #	Option A	Option B		Please choose A or B
1	$1	$3 never	$0 if 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
2	$1	$3 if 1 comes out of the bingo cage	$0 if 2,3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
3	$1	$3 if 1 or 2	$0 if 3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
4	$1	$3 if 1,2 or 3	$0 if 4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
5	$1	$3 if 1,2,3,4	$0 if 5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	

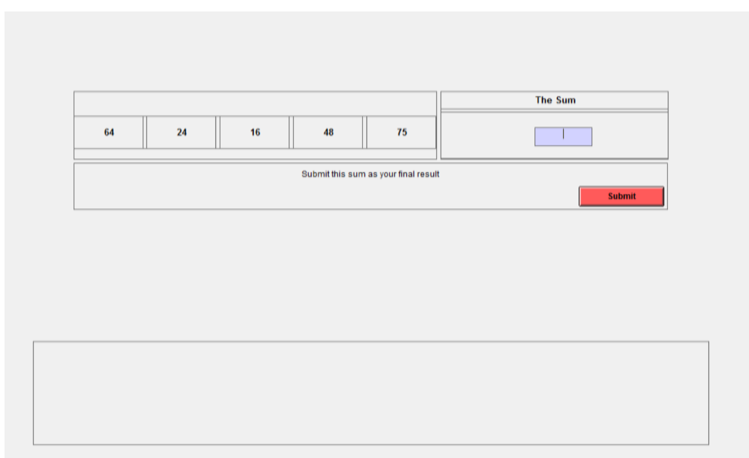
The subjects were told that the gambles on the questionnaire were based off of what number was randomly selected out of a bingo cage located in the lab. For example, on decision point 2, the second line on Figure 3.1, if the subject selected A in the right most column with the heading “Please choose A or B” they would receive $1 regardless of what number randomly came out of the bingo cage. However, if the number one was the number that came out of the bingo cage, the subject would receive three dollars if they had chosen B. If the number that randomly came out of the bingo cage was any number between two and twenty, and the subject had selected B, they would have received zero dollars. The bingo cage is a clear plastic ball with pegs inside numbered from one to twenty. To select a peg there is a handle on the side of the plastic cage of which an experimenter will turn to have a peg come out. This is how the bingo cage randomly selects a number. The subjects were informed that a random decision point from the questionnaire would be selected at the end of the experiment to be added to their overall payment for the experiment. For example, if the bingo cage randomly produced the number five that would be the decision point from the questionnaire of which the subjects would receive payment on. Once the decision point was randomly selected, that numbered peg would be placed back into the bingo cage and once again the experimenter would turn the handle so the bingo cage produced another random number. This random number would be used to determine what the outcome of decision B would be either three dollars or zero dollars. This questionnaire was used to collect risk preference data on the subjects. This data was analyzed for this thesis and will be reviewed later in the paper.

After the subjects had filled out the risk questionnaire the computerized part of the experiment began. The first thing the subjects did was fill out basic information, such as, age gender name race etc. Once they were through with that piece, the task part of the experiment commenced. The experiment was comprised of three tasks[8]. Instructions were read aloud at the beginning of each task[9]. Before the instructions were read aloud, the subjects were not aware of any of the design features of the tasks that were to follow. Therefore, the participants had no way of knowing what the subsequent tasks would hold.

[8] The program was written in Z-tree coding
[9] A copy of the full instructions for this experiment are provided in the appendix of this thesis

The design of the experiment was modeled after a design by Niederle and Vesterlund (2007)[10] and used the same addition exercise in the three different tasks. In each of the three tasks, the subjects are instructed to sum a set of five two-digit numbers and get the correct answer. These math problems are shown on the computers in front of the subjects. There is an outlined box directly beneath the problem that the subject can type their answer. Once they have typed in their answer the subjects hit the "submit" and they are finished with that problem and another problem is instantaneously provided for them to complete. Below is a screenshot of what the subjects saw during the addition piece of the experiment.

Figure 3.2 Piece Rate Screen Shot



[10] Niederle, Muriel and Lise Vesterlund. "Do Women Shy Away from Competition? Do Men Compete Too Much?" July 11, 2005. Accessed October 15, 2016. http://www.nber.org/papers/w11474.

The program will also displays a box with the number of correct answers the participant has submitted up to that point. The participants continued this pattern until the five-minute time limit expired. The details of each of the three tasks will now be explained in detail.

Task 1- Piece Rate

This is the first task that the subjects were instructed to complete. The subjects were informed that they would be asked to calculate the sum of five randomly generated two-digit numbers. They were also made aware that they would be given a total of five minutes to complete this task. The participants were asked not to speak to one another for the duration of the experiment; however, they were made aware that if they had any questions they could raise their hands an experimenter would come to their aide. The subjects were not allowed to use a calculator to determine the answer to the problems; however, they were allowed to use the scratch paper and pencils that were provided to them. Once they believed they had the correct answer, they were to submit it into the computer and move on to the next problem. The computer would notify them immediately whether or not the answer was correct. The experimenter would notify the subjects when thirty seconds remained in the task.

If task 1 was randomly selected as payment at the end of the experiment, each subject would receive $0.50 per problem they answered correctly within the five minutes. They participants were also informed that they would not be penalized; their pay would not decrease, if they provided an incorrect answer to a problem.

Task 2- Manager's Choice

In the second task of the experiment, each subject was asked to play two roles, one role being the manager, one being the worker. In both roles, the subjects will make decisions that will then be recorded in the computer and be used as the data analyzed for this thesis. The subjects were told that if task two was chosen at the end of the experiment for payment, there would be a random determination of which role was paid. Since they didn't know which role would be paid they were instructed to make careful decisions in both roles.

Role 1 - The Manager

When the subjects came into the lab they were seated in groups of two for this portion of the experiment each person was told they were grouped with the person next to them. As the manager, the subjects had to make the decision of whether or not they wanted to hire the person next to them or hire a random worker. The subjects were told that if they chose to hire a random worker they would get a randomly assigned performance from someone in a different session of the same experiment, who also performed the addition task. If the managers chose to hire the random person, they were not told how many problems this random worker correctly completed before making their decision, however, they were told that the average number of correct problems for the addition task is 10 problems. The managers also had the ability to see how many problems the person next to them solved correctly in task one before making the decision on whether or not to hire them. So, before making their decision the managers knew the amount of problems the person they were paired with solved correctly in task one, as well as, the average number of correct problems participants submitted in the addition task. This gave the managers a metric for which they could gage the productivity of the worker. However, if they chose to pick the random worker from another session, they did not know what the level of productivity (the amount of correct answers) the random worker would be.

Role 2 - The Worker

The second role the subjects had to perform was that of the worker. As in task one, the worker was instructed that they would be given five minutes to calculate the correct sum for a series of five two digit numbers. The instructions explained that if task two was selected for payment then the computer would randomly determine what role the subjects would be paid for. If the computer randomly selected the manager role for payment, the subject's earnings would depend on the worker they chose to hire. If the manager chose the person next to them they would earn $0.50 for every problem that person solved correctly in task two. If the manager decides to pick a random worker, they will still receive $0.50 for every problem the worker solved correctly. If the computer chose the role of the worker for payment, then all subjects received $0.50 of every problem they answered correctly in task two.

Task 3 – Negotiation

The last task the subjects were asked to complete was the negotiation task. In the beginning of this task the computer would randomly assign a role for each subject, either as a manager or a worker. The subjects were aware of their role in this task when they were making decisions. If a participant was selected to me in the manager role they would not solve problems in this task. If they were selected to be a worker in this task, they once again were give five minutes to calculate the correct sum of a series of five two digit numbers. Before the workers began the addition problems, they had to negotiate with the managers. The workers were to propose a pay rate to the manager and the manager would then either accept or reject the worker's proposed pay rate. This pay rate is the rate at which the worker and manager earn money for correct answers submitted by the worker. The worker's choices are as follows:

1. The worker gets $0.60 for each correct problem and the manager gets $0.40 for each correct problem.
2. The worker gets $0.55 for each correct problem and the manager gets $0.45 for each correct problem.
3. The worker gets $0.50 for each correct problem and the manager gets $0.50 for each correct problem.
4. The worker gets $0.45 for each correct problem and the manager gets $0.55 for each correct problem.

Once the worker has made their decision they submit it through the computer program. Then the manager observes the worker's performance in task one as well as the worker's proposed pay rate. After the manager has reviewed this information, he/she would either accept or reject the proposed pay rate and hit the submit button.

The manager's decision was then communicated back to the worker and the five-minute problem solving session was started.

If task three was selected for payment at the end of the experiment, the amount paid was contingent on the negotiation decision that was made as well as the number of problems that the worker correctly solved during this task. If the manager accepted the worker's proposal, then the manager and the worker earn the money as outlined in the proposal. For example, if the worker proposed option one, the worker gets $0.60 and the manager gets $0.40 for every correct problem the worker solved, then that is how they would both be paid for task 3. However, if the manager rejected the proposed pay rate then the worker earns $0.50 for every problem they answered correctly in the five-minute period. The manager that rejected the proposal is paid based off of the performance of a random worker in a different session. The manger would get paid $0.50 for every problem that the random worked answered correctly. The subjects were once again reminded at this time that the average amount of problems solved correctly was ten.

After the workers completed the last five-minute addition session in task three, the experiment was over. The experimenter then got up in the front of the room and used the bingo cage to begin the process of payment. The first number out of the bingo was used to determine what decision point, from the risk preference questionnaire, to pay the subjects on. The next number produced from the bingo cage was to determine the gamble in option B if any of the subjects had picked B on the decision point they were being paid on. The next number drawn from the cage was which task the subjects would be paid on, one, two, or three. Depending on which task was chosen for payment the experimenter would then walk around and pay out the subjects based on their performance in the task that was selected. To find out how many correct answers a subject solved the experimenter would use the program on the computer terminals which stated the subject's answers and decisions for any given task. Once the experimenter had come to a subject's station and paid them for their participation the subject was free to leave and the session was over. After every session, the experimenter would save the data from the Z-tree code and reset all the terminals for the next session. This experiment had fourteen sessions and one hundred and ninety participants.

CHAPTER FOUR: RESULTS

Once the sessions for this experiment had been completed the data needed to be analyzed. First, analyzed was the risk questionnaire. In the literature review portion of this thesis, there were many articles that stated gender effects risk preferences. Since the risk questionnaire captured both of this attributes it would be wise to analyze the data and see if it comes to the same conclusion.

The risk questionnaire had a list of fifteen different decision points the subjects had to make a decision on. At every decision point the subject had to choose either option A or option B. Option A was always the less risky of the two options because it guaranteed the subject would always receive $1.00. Option B was the riskier option because there was a chance that the subject could receive $0.00 or $3.00. A full copy of this questionnaire is in the appendix for reference purposes. The data for this questionnaire was collected in two columns. The first column was labeled "safe" and it had the amount of safe choices a subject chose. For example, if a subject chose A for the first ten decisions and then switched their answer to option B at the eleventh decision point they would receive a safe score of 10. The higher a subject's safe score is the more risk adverse they are. As the decision points go down the page the risk of the gamble changes. At decision point one, there is zero chance of a subject receiving three dollars in option B therefore, the only way they could make money is if they picked option A. In decision point two the subject now has a one in twenty chance of making three dollars as well as a nineteen in twenty chance of making zero dollars in option B. At this same decision point, option A still gives the subject a one hundred percent chance at making one dollar. As the subject moves through the decisions points the probability of obtaining three dollars in option B grows higher, however it never reaches one hundred percent. If one subject chooses choice A for the first five decision points and then changes to option B for choice sixth decision point they get a safe score of five. If another subject chooses option A for the first ten decision points and then changes to option B they have a safe score of ten. In this example, the second subject appears to be more risk adverse than the first subject because they had a safe score of ten while the first subject had a lesser safe score of five. In other words, a higher the safe score implies a more risk adverse subject.

Now that the methodology for the risk preferences questionnaire has been thoroughly explained, the data itself will be analyzed. The first statistic to consider is the average of safe score based on gender. The average risk score of all the males that participated in the experiment was 8.57 while the average risk score of all the females was 9.04. The meaning behind these numbers is that on average the male participants choose option A for the first 8.57 options and then switched to option B; however, the female subjects choose option A for the first 9.04 decision points and then switched to option B. Another way to say this is that females chose the safer option longer than the males. From this basic data metric, it appears that the men in this study were in fact more risk loving relative to their female counterparts. While a basic average does show easily that men are more risk loving than women in this study there is a deeper dive that can be taken into this data

Figure 4.1 Subject's Safe Scores

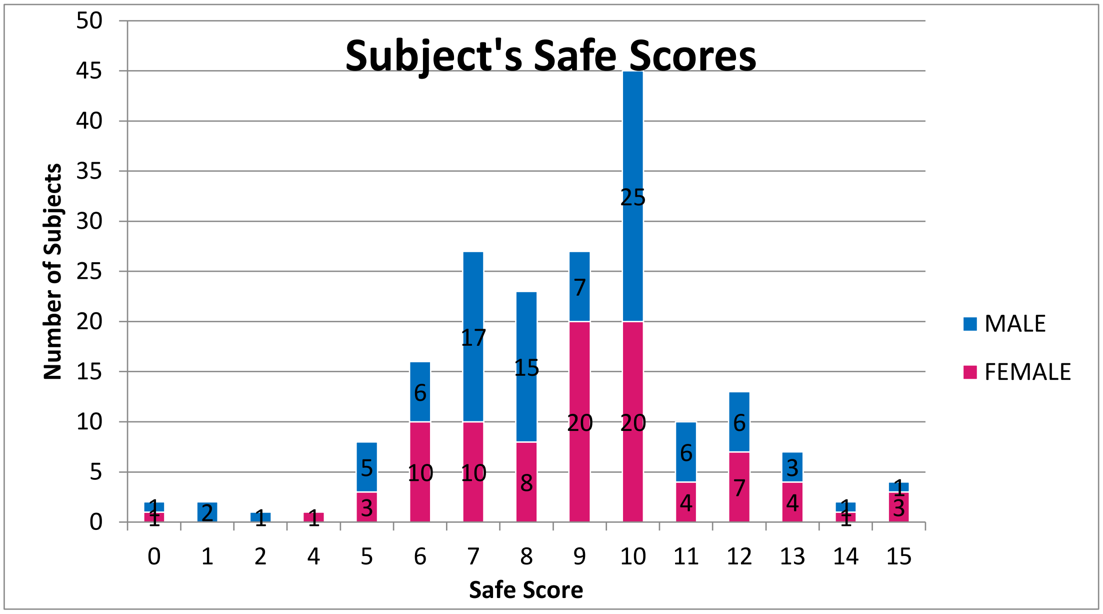


Figure 4.1 shows each subject's safe scores. The subjects are broken down into two categories male and female. The pink portion of the bar is the number of females that chose that particular safe score and the blue portion is the number of males that chose that same safe score. The exact number of subjects comprising each bar is also represented in the black numbers on the bars themselves. The averages mentioned above were 8.57 for males and 9.04 for females. The graph shows that forty female subjects, almost 50% of the female population, had a safe score of either 9 or 10. For the same range only thirty-two subjects, 33% of the male population chose a safe score of 9 or 10. The safe scores of 7 and 8 had 33% of the male population in this range while females only had 19% of their population in this same range. So as the range got risker, from 9 and 10 to 7 and 8, female presence decreased while the male stayed the same.

Another overall take away from the graph is that females seem more "predictable" than the males or said differently the females were more consistent with their answers overall than the males. Half of the females in the experiment had a safe score of 9 or 10 while the males were more spread out in their risk preferences. So, does that mean that females as a gender are more similar in their preferences than their male counterparts? This thesis does not have enough information to answer that question definitively but there does seem to be evidence towards that idea.

When it comes to comparing the averages of 8.57 for males and 9.04 for females there must be F and T tests ran to see if these means are statistically significant or if they are just random. Said differently, to compare the two averages and draw conclusions from the comparison, the means of the two populations must be proven to be statistically significant first. The first hypothesis test that was preformed was an F-Test two see if the variances in the two populations, male and female safe scores, were equal or not. The results are below in Figure 4.2.

Figure 4.2 F-Test Two-Sample for Variances Results

F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	8.572916667	9.043478261
Variance	7.047258772	6.459627329
Observations	96	92
df	95	91
F	1.090969868	
P(F<=f) one-tail	0.338371171	
F Critical one-tail	1.410141599	

The results show that the P level of .34 is greater than the alpha level of .05 so the null hypothesis cannot be rejected. The F Critical one-tail result of 1.41 is greater than the F result of 1.09 which also means the null hypothesis cannot be rejected. Since the null hypothesis cannot be rejected that means the variances must be considered equal. This test is necessary because it signals which T-test needs to be used. The variances are considered equal between the male and female population so the t-Test: two-sample assuming equal variances will be used. The results from the t-Test are seen below in figure 4.3.

Figure 4.3 t-Test: Two-Sample Assuming Equal Variances Results

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	8.572916667	9.043478261
Variance	7.047258772	6.459627329
Observations	96	92
Pooled Variance	6.759761668	
Hypothesized Mean Difference	0	
df	186	
t Stat	-1.240513206	
P(T<=t) one-tail	0.108174067	
t Critical one-tail	1.653087138	
P(T<=t) two-tail	0.216348135	
t Critical two-tail	1.972800114	

The outcome of the t-test shows that the P(T<=t) two-tail value is .22 which is greater than the alpha level of .05 and means the null hypothesis cannot be rejected. Therefore, the null hypothesis that the average risk score is equal across the two samples cannot be rejected. While the averages of 8.57 for males and 9.04 for females appear different the t-test shows that the difference is not statistically significant.

The next data set to be analyzed was the productivity measure used in this experiment. In a hiring decision, a manager typically has a resume from the candidate they are interviewing. Resumes have vital information on the candidate that helps the manager make an informed decision on whether or not to hire them. Since this is a very common occurrence in the real world, the experiment was designed to have some resume-type information on the workers that the managers could see. This is where the addition of the five two-digit numbers comes into play. In the experiment a manager has the ability to see how many problems a worker was able to solve in the five-minute time frame. The managers also know that the average amount of problems solved by individuals in the addition task is ten so they have a benchmark of which they can judge their potential employees against. This was another design put in place to mirror reality because in the real-world managers know how their other employees perform when interviewing a potential employee and can use that knowledge to make an informed hiring decision.

So, the first piece of data analyzed from the addition task was if gender seemed to affect performance. The first analytical tool that was used was an average. The average number of correct solutions from male subjects was 10.59 while the average number of correct solutions from female subjects was 9.67. So, on average males submitted around one more correct answer in the five minutes than their female counterparts. Does this give evidence that just because an individual is male they are better at math problems than females? So, is gender a predictor of how well an individual will do on the addition portion of this experiment? A regression analysis was run to see if gender (the independent variable) was correlated to the amount of correct problems submitted (the dependent variable) the results are as follows:

Figure 4.4 Gender and Correct Solutions Regression Output

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.123695211
R Square	0.015300505
Adjusted R Square	0.010034733
Standard Error	3.651322549
Observations	189

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	38.7386126	38.7386126	2.905652	0.08993033
Residual	187	2493.113239	13.33215636		
Total	188	2531.851852			

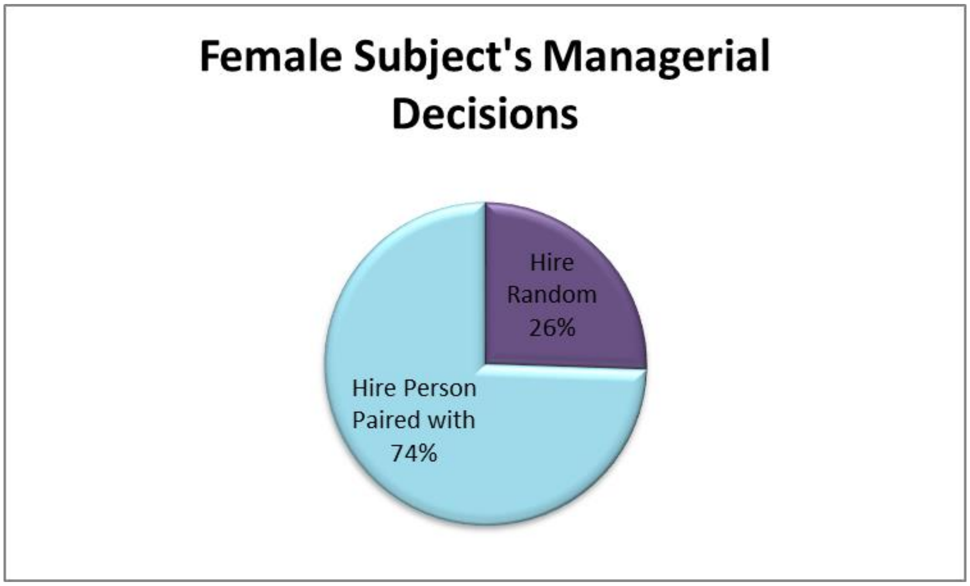
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	9.688172043	0.378624511	25.58781001	5.4E-63	8.941247721	10.43509636	8.941247721	10.43509636
0	0.905577957	0.531256199	1.704597441	0.08993	-0.142447633	1.953603547	-0.142447633	1.953603547

The output above yields this equation for the regression analysis; Number of Correct Problems=9.67 + 0.924*Gender. It also shows that the R-Square value is only 2% which means, only 2% of the variation in correct solutions submitted is explained by the independent variable of gender. The closer to 100%, the better the regression line fits the data. Clearly 2% is very far from 100% and therefore it doesn't seem that these two variables are highly correlated. The other highlighted value is Figure 4.2 the *Significance F* value or the P-value. This value is helpful in informing whether or not the null hypothesis should be rejected. The null hypothesis is a term in statistics that refers to the general statement that there is no relationship between the two variables at which the regression is looking at. For example, for the regression analysis above the null hypothesis would be that gender and amount of correct problems a subject solved do not have a statistically significant relationship between the two of them. The equation for the null hypothesis would be H0: $\beta 1=0$ vs H1: $\beta 1 \neq 0$ at $\alpha=0.05$. The regression was run to see if there was in fact a relationship between these two variables so the null hypothesis is just the statement against the hypothesis. So, the p-value above shows 0.08993033 which is higher than 0.05 and shows that the null hypothesis should not be rejected. Using an α (alpha) = 0.05 is standard in statistical practices as the benchmark to either accept or reject the null hypothesis. The alpha level of 0.05 means there is a 5% chance of having a type one error, which is when the null hypothesis is rejected when it is actually the truth. For this thesis, an α will always =0.05.

In conclusion, the regression analysis above showed that the null hypothesis, that gender and the amount of correct addition problems submitted are not related, should not be rejected. Said differently, there doesn't seem to be much evidence that gender is significantly correlated to the amount of correct problems a subject will submit. So, while the data shows that men, on average, submit more correct answers than females, gender itself doesn't seem to be correlated with the number of correct problems of a subject. This is an important observation to point out because if only the average amount of correct solutions was analyzed from the data, a person could easily think that gender alone was the reason males seemed to do better than females; however, the regression analysis gives us evidence that this is not the case and there is more at play here than just gender.

The next data set analyzed was for task two, the manager's choice. For this task, every subject had to make a decision on whether or not to hire the person they were paired with or hire a random worker. Below is a chart of the female manager's decisions in this task.

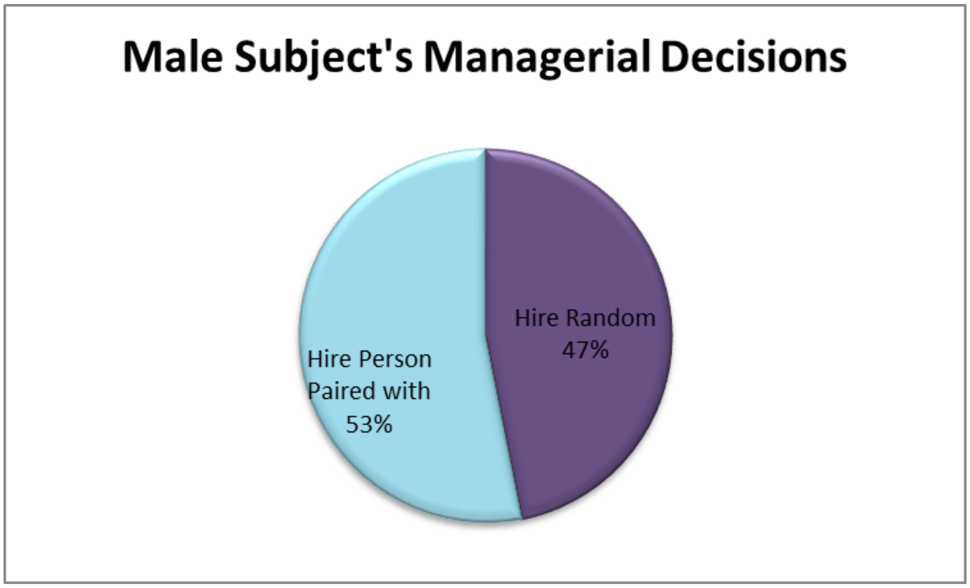
Figure 4.5 Female Managerial Decisions



As the graph shows 74% of the time a female manager chooses to hire the individual they were originally paired with instead of hiring a random worker. They only chose a random worker 26% of the time.

The next graph shows how the outcome of the male manager's decisions.

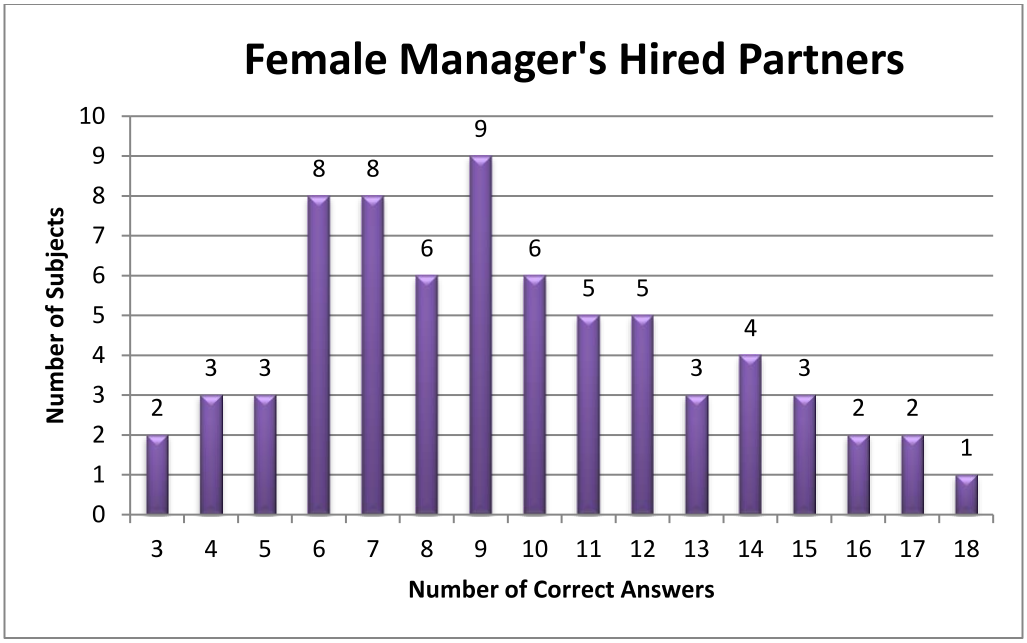
Figure 4.6 Male Managerial Decisions



When it comes to males, they are much closer to an even split on whether or not they chose the worker they were originally paired with or a random worker. So why it is that a female manager chose the person next to them so much more often than a male manager? One other piece to this task in the experiment was that the managers were aware of their partner's productivity. Once again, the measure of productivity in this experiment was how many correct addition problems a subject could solve in the five-minute time span. The managers were also aware that the average level of productivity was ten so if these female mangers chose the person next to them because they had a high level of productivity that would make sense. The level of productivity of the workers will now be analyzed from the data set.

Figure 4.7 shows the dispersion of partners that were paired with a female manager.

Figure 4.7 Female Manager's Hired Partners

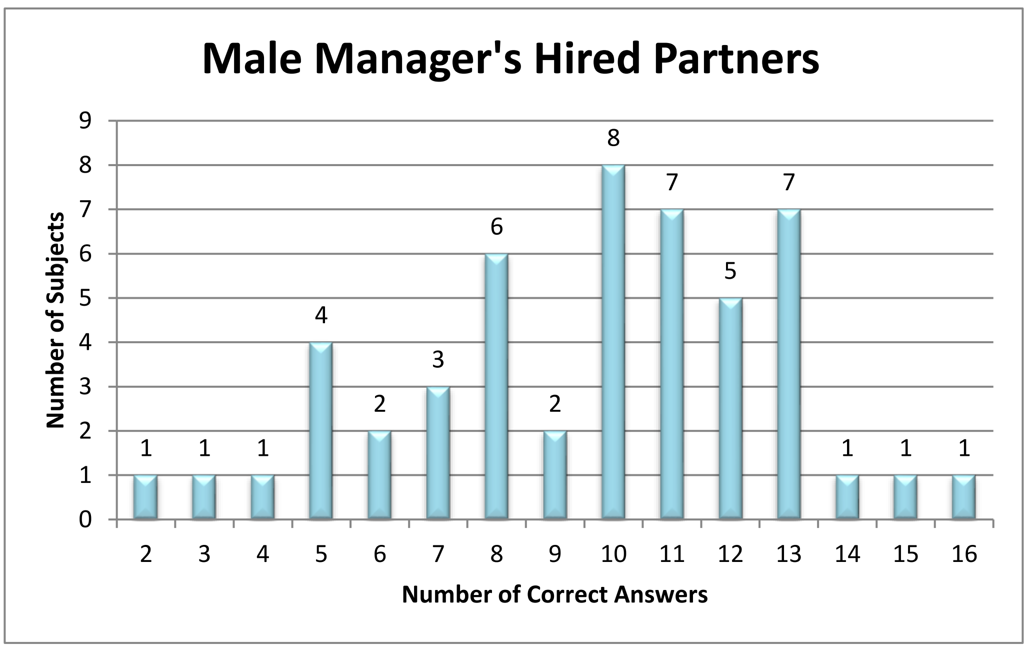


The graph above displays the number of correct answers for the subjects that the female managers chose to hire instead of hiring a random worker. As stated above all the managers were aware that the average number of problems solved was ten. Any subject who had a productivity level above ten means they were better than the average worker. However, if the manager was paired with a subject who had a productivity level less than ten they had the option to take a risk and hire a random worker and hope they had a higher productivity level than the subject they were paired with. It is true that the random worker could have a productivity level less than ten but that is all part of the risk.

In Figure 4.7 there are a total of 39 subjects that were under the average of ten correct problems submitted that a female manager chose to hire instead of a random worker. So, did these female managers that picked subjects below the average rate of productivity hire poorly? Do their male counterparts hire the same way?

Now that the female manager's choices have been analyzed it is time to move to the male manager's decisions. Figure 4.8 below has the same parameters has Figure 4.7 it is just for the male managers not the female.

Figure 4.8 Male Manager's Hired Partners



Observing the table above it is clear quickly that there are much less subjects in the below ten range than there were in the female chart. There are also less subjects overall in this graph than in Figure 4.7. So, percentages will be helpful here in understanding what the data is showing. In the female manager's graph, 56% of the employees they hired were under the average productivity level of ten while in the male manager's graph, only 39% of the employees they hired were under that same range.

To be able to speak accurately about the whole data set the subjects that the managers rejected must also be analyzed. Below are the graphs for these data sets.

Figure 4.9 Female Manager's Rejected Partners

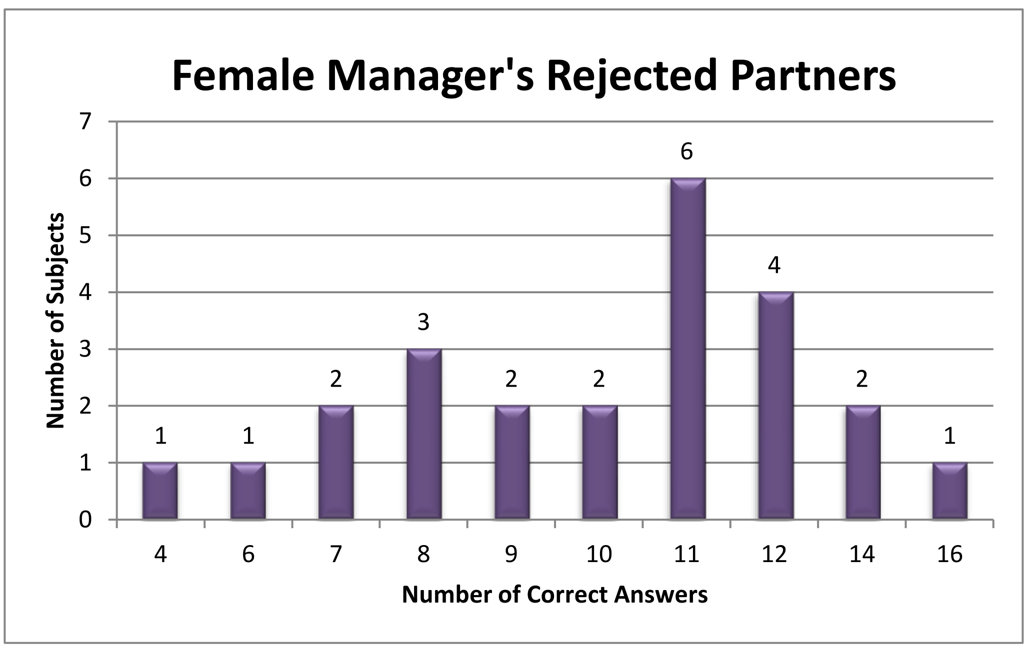
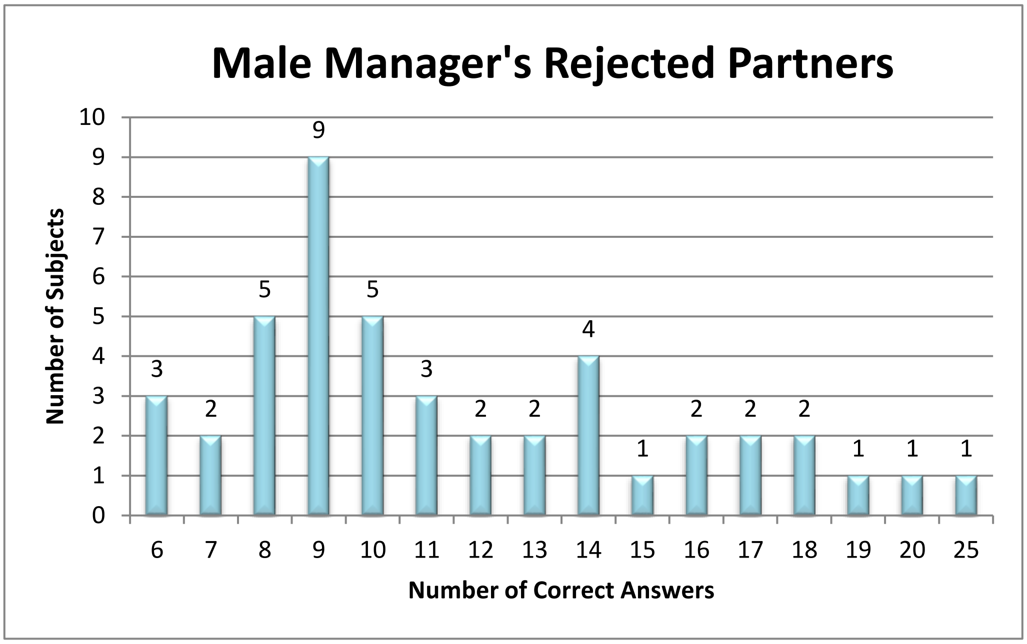


Figure 4.10 Male Manager's Rejected Partners



The two figures above show the subjects that the managers rejected. The male graph will have more subjects overall than the female graph because more male managers rejected their partners and chose to hire a random worker. It makes more sense to reject a worker under the average productivity line of ten. If a manager rejects a worker who has productivity level of above ten they have decent odds that their new random worker will have a productivity level of below that of the worker, they just rejected.

Now looking back at the graphs, 38% of the subjects that females rejected had a productivity score below ten and 42% of the subjects that males rejected were below the productivity score of ten. However, in this graphs it is also important to look at subjects that were rejected even though they had high productivity scores.

Female managers rejected 15 individuals who had productivity scores at or above ten while male managers rejected 26 individuals who had higher than average productivity scores. Clearly neither gender simply looked at the productivity score and made their decision solely on that metric or else the graphs would show that only employees at or above ten were hired and only employees below ten were rejected. Some other factor must be driving these managers' decisions.

This thesis will not be analyzing the data collected in task 3 of the experiment. More treatments and irritations of the experiment need to be completed before bringing in task 3's results.

CHAPTER FIVE: CONCLUSION

The main result presented in this thesis is that there is a clear difference in how different genders approach risk and hiring decisions. Males seem to be more risk loving than their female counterparts when taking gambles like hiring a random worker. Male answers in the risk survey did seem to be higher, on average, than their female counterparts but, this result, once tested came back as not statistically significant. Males also scored higher, on average, than the females on the math problems. When a one variable regression analysis was run to see if the number of math problems solved correctly was correlated to gender the answer was that the null hypothesis should not be rejected. Therefore, there didn't seem to be much evidence that gender was correlated to the number of math problems correctly submitted.

The next result of this thesis was that female managers didn't reject the subject they were paired with nearly as often as their male counterparts. Males were almost a fifty-fifty split with the amount of times they hired the worker next to them and the amount of times they chose the random worker. While females chose the person, they were paired with almost 75% of the time. However, in both the male and female managerial decisions there were many times where a manager should have rejected a worker they were paired with and did not and times where they chose the random worker and should have picked the individual they were paired with.

All in all, this thesis sheds light on the role of performance and gender in hiring decisions Future studies, should focus on why managers do not focus on the productivity level of the subjects when they make hiring decisions. Why do female managers seem to reject workers less often than male managers? Why do male managers pick a random worker more often than their female counterparts? Why would a male manager reject a worker who has a productivity level higher than the average? Why would a female manager hire a worker who has a productivity level much lower than the average? Do female managers make quicker connections to their workers than male managers do? These are all questions that came out of analyzing the data supplied by this experiment. This thesis does not have the ability to answer all of them but it does give more information on the role of performance and gender in hiring decisions. It gives more transparency to the highly complex strategic interaction of a manager and potential employee. More treatments and iterations of this experiment must be done if these questions hope to be answered. Like most research, this paper lead to a path of more works needing to be completed. But isn't that the point of research, to further knowledge in some areas and to open up doors to new ideas?

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Appendix

Instructions for the Experiment

WELCOME

This is an experiment in the economics of decision making. Various research agencies have provided funds for this research. The instructions are simple. If you follow them closely and make appropriate decisions, you can earn an appreciable amount of money.

The experiment will proceed in two parts.

In Part 1 of the experiment you will make a series of choices in decision problems.

In Part 2, you will be asked to complete three tasks. At the end of today's experiment, one of the three tasks in Part 2 will be randomly selected and you will be paid for your performance in that task. Once you have completed all three tasks, we will determine which task will be counted for payment by picking a number 1 through 3 from a bingo cage. Before each task, we will describe in detail how your payment is determined.

Any money that you earn in Part 1 will be added to your earnings for Part 2 along with an experiment completion payment of $5.

It is important that you remain silent. If you have any questions, or need assistance of any kind, please raise your hand and an experimenter will come to you. If you talk, laugh, exclaim out loud, etc., you will be asked to leave and will not be paid. We expect and appreciate your cooperation.

Are there any questions?

INSTRUCTIONS FOR PART 1

YOUR DECISION

In this part you will be asked to make a series of choices in decision problems. How much you receive will depend partly on **chance** and partly on the **choices** you make. The decision problems are not designed to test you. What we want to know is what choices you would make in them. The only right answer is what you really would choose.

For each line in the table in the next page, please state whether you prefer option A or option B. Notice that there are a total of **15 lines** in the table but just **one line** will be randomly selected for payment. You do not know which line will be paid when you make your choices. Hence you should pay attention to the choice you make in every line. At the end of today's experiment, a token will be randomly drawn out of a bingo cage containing tokens numbered from **1 to 15**. The token number determines which line is going to be paid.

Your earnings for the selected line depend on which option you chose: If you chose option A in that line, you will receive **$1**. If you chose option B in that line, you will receive either **$3** or **$0**. To determine your earnings in the case you chose option B there will be a second random draw. A token will be randomly drawn out of the bingo cage now containing twenty tokens numbered from **1 to 20**. The token number is then compared with the numbers in the line selected (see the table). If the token number shows up in the left column you earn $3. If the token number shows up in the right column you earn $0.

Are there any questions?

Participant ID _________

Decision #	**Option A**	**Option B**		Please choose A or B
1	**$1**	**$3** never	**$0** if 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
2	**$1**	**$3** if 1 comes out of the bingo cage	**$0** if 2,3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
3	**$1**	**$3** if 1 or 2	**$0** if 3,4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
4	**$1**	**$3** if 1,2 or 3	**$0** if 4,5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
5	**$1**	**$3** if 1,2,3,4	**$0** if 5,6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
6	**$1**	**$3** if 1,2,3,4,5	**$0** if 6,7,8,9,10,11,12,13,14,15, 16,17,18,19,20	
7	**$1**	**$3** if 1,2,3,4,5,6	**$0** if 7,8,9,10,11,12,13,14,15,16,17,18,19,20	
8	**$1**	**$3** if 1,2,3,4,5,6,7	**$0** if 8,9,10,11,12,13,14,15,16,17,18,19,20	
9	**$1**	**$3** if 1,2,3,4,5,6,7,8	**$0** if 9,10,11,12,13,14,15,16,17,18,19,20	
10	**$1**	**$3** if 1,2,3,4,5,6,7,8,9	**$0** if 10,11,12,13,14,15,16,17,18,19,20	
11	**$1**	**$3** if 1,2, 3,4,5,6,7,8,9,10	**$0** if 11,12,13,14,15,16,17,18,19,20	
12	**$1**	**$3** if 1,2, 3,4,5,6,7,8,9,10,11	**$0** if 12,13,14,15,16,17,18,19,20	
13	**$1**	**$3** if 1,2, 3,4,5,6,7,8,9,10,11,12	**$0** if 13,14,15,16,17,18,19,20	
14	**$1**	**$3** if 1,2, 3,4,5,6,7,8,9,10,11,12,13	**$0** if 14,15,16,17,18,19,20	
15	**$1**	**$3** if 1,2, 3,4,5,6,7,8,9,10,11,12,13,14	**$0** if 15,16,17,18,19,20	

Part 2: Task 1- Piece Rate

For Task 1 you will be asked to calculate the sum of five randomly generated two-digit numbers. You will be given 5 minutes to calculate the correct sum for a series of these problems. You cannot use a calculator to determine the answers to the problems; however you are welcome to use the scratch paper that is supplied to you. You submit an answer to a problem by clicking the submit button with your mouse. When you enter an answer, the computer will immediately tell you whether you answer is correct or not. I will give notice when 30 seconds remains in the task.

Payment

If Task 1 is randomly selected for payment, you will receive $0.50 per problem that you correctly solved within the 5 minutes. Your payment does not decrease if you provide an incorrect answer to a problem.

Please do not talk with one another for the duration of the experiment. If you have any questions, please raise your hand now and we will answer your question in private.

Part 2: Task 2 –Manager's Choice

In this part of the experiment there are two roles that you will play. You will make decisions in the role of a manager and in the role of a worker. The decisions that you will make in each role are outlined below. At the end of today's experiment we will randomly determine which role will be paid. Since you do not know which role will be paid, you should make careful decisions in both roles.

ROLE 1: The Manager: You will decide to either hire the PERSON NEXT TO YOU or hire a RANDOM WORKER. You will be paid based on the performance in the addition task of the person you hire.

If you choose to hire a RANDOM WORKER you will get a randomly assigned performance from someone in a different session who performed the addition task. You do not know how many problems they solved correctly but you do know that the average number of correct problems in the addition task is 10 problems.

For the PERSON NEXT TO YOU, you will be told how many problems the person next to you solved in Task 1 of today's experiment.

NOTE: The average number of correct problems solved in task 1 is 10 problems.

ROLE 2: The Worker: As in Task, 1 the worker will be given 5 minutes to calculate the correct sum for a series of five two digit numbers.

You will be paid based on the number of correct problems you solve, similar to task 1.

Payment

If task 2 is selected for payment which role you are paid for will be randomly determined by the computer at the end of today's experiment.

If you are paid based on your decisions as the MANAGER your earnings will depend on the worker you choose to hire. If you choose to be paid on the performance of the person next to you, you will earn $0.50 for every problem that the person solved correctly in Task 2.

If you choose to be paid based on the performance of a random worker then you will receive $0.50 for every problem a random person solved correctly.

If you are paid based on your actions as the WORKER, you will receive $0.50 for every problem that you correctly solve in Task 2.

Please do not talk with one another for the duration of the experiment. If you have any questions, please raise your hand now and we will answer your question in private.

Part 2: Task 3- Negotiation

In this task you are assigned a role at the beginning of the task. Your role will be either as the MANAGER or the WORKER. You will know your role when you make your decisions.

MANAGER'S TASK: The manager does not solve problems in task 3. The manager earns money for each problem the worker solves correctly. Before the worker solves problems the worker will propose a pay rate to the manager. The manager either ACCEPTS or REJECTS the worker's proposed pay rate.

WORKER'S TASK: As in Task 1, the worker will be given 5 minutes to calculate the correct sum of a series of five two digit numbers. BEFORE the 5 minute session, the worker has the ability to negotiate with the manager the rate at which the worker and the manager earn money for correct answers submitted by the worker. The workers choices are below.

Option 1: The worker gets $0.60 for each correct problem and the manager gets $0.40 for each correct problem.

Option 2: The worker gets $0.55 for each correct problem and the manager gets $0.45 for each correct problem.

Option 3: The worker gets $0.50 for each correct problem and the manager gets $0.50 for each correct problem.

Option 4: The worker gets $0.45 for each correct problem and the manager gets $0.55 for each correct problem.

The option chosen by the worker is then communicated to the manager along with the worker's performance in task 1 and the manager either accepts or rejects the proposed pay rates. The manager's decision is then communicated to the worker and the five minute problem solving session is started.

Payment

If task 3 is selected for payment your earnings will depend on the negotiation decision that was made and the number of problems that the worker correctly solves.

If the Manager ACCEPTS the worker's proposal then the manager and the worker earn money as outlined in the proposal.

If the manager REJECTS the proposal then the workers and manager's earnings are determined as follows.

- Worker's Earnings: The worker earns $0.50 for every problem correctly solved in the 5 minute period.

- Manager’s Earnings: The manager is paid based on the performance of a random worker. The manager is paid $0.50 for every problem that a randomly chosen worker from another session of the experiment solved correctly. Note that the average number of problems solved by subjects is 10 problems.

Please do not talk with one another for the duration of the experiment. If you have any questions, please raise your hand now and we will answer your question in private. Thank you for your participation.