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Effects of Incentives on College Student's Performance

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Abstract

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Keywords

pay for performance, incentives, behavioral economics

Disciplines

Benefits and Compensation | Business Administration, Management, and Operations | Organizational Behavior and Theory

Comments

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Effects of Incentives on College Student's Performance

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May 9, 2020

Abstract

Pay for performance embodies a theory that the more an employee is paid for their work, the more productive they will be. Using an online survey, this paper studies the effect of incentives on college students, specifically, if college students react differently to incentives than employees and to what degree college students can be motivated to increase their performance on assignments. Participants in the bonus contract were awarded one extra piece of candy for each correct answer. Those in the penalty contract are given the maximum ten pieces of candy before the quiz begins, and with every incorrect answer, one piece of candy is removed from the pile. The results of this study show that participants in the bonus and penalty structure did not differ in performance levels or effort exerted. However, students with a higher preference for compensation in candy also had higher performance levels, but did not spend more time on the task. Participants also showed a preference to be compensated with candy.

Keywords: behavioral economics, pay for performance, payment contracts, incentives

Introduction

The theory of pay for performance is one that is studied across many fields of academics, including psychology and economics. It is widely researched in many different ways in an attempt to explain human behavior and how one is motivated. One of the main goals of any employer is to maximize productivity. There have been many tests conducted to try and discern different ways to maximize production and output. The key is to find something that people value as an incentive to try and increase production. It has been found that money is a universal incentive and that we as humans respond well when we are incentivized by money or currency. From this, it has been determined that the more money an employee is given, the more they will work and therefore the more they will produce. This experiment uses candy as the incentive through a bonus and penalty contract. Participants are asked to answer ten quiz questions at a fifth grade level. Participants in the bonus contract receive one additional piece of candy for each correct answer. Those in the penalty contract receive the maximum ten pieces of candy before they begin the quiz and with each incorrect answer, one piece of candy is removed from the pile. If a participant in the bonus contract answers seven questions correctly, they receive an additional seven pieces of candy. Similarly, if a participant in the penalty contract also answers seven questions correctly, they are left with seven pieces of candy, therefore both contracts are economically equivalent. Within the penalty contract, there is an influence of loss aversion. This is because those participants receive their candy in the form of a lump sum before they start the quiz. Thus, participants find it harder to part with the candy and will increase their effort in order to keep it. Many authors of different pieces of literature have found this to be true. There have

also been further developments that clearly articulate how humans respond to different incentive scenarios and which work best at motivating employees.

The theory of pay for performance can be tested in many different ways. Researchers can choose to measure different variables, use different types of payment schemes, choose the setting, and the participant pool. The researcher has full autonomy when testing the theory of pay for performance. Booth and Frank (1999), Jensen and Murphy (1990), Lazear (1996), and Weber and Mayer (2011) all use a theoretical approach to discuss the theory behind pay for performance. Further, incentives can be any form of compensation that the target population values. One of the most common forms of incentives is money or another form of currency. With that in mind, researchers studied the different ways that money could be presented in order to discern the best way to motivate people. Many papers have tested a combination of different payment structures including a bonus or penalty contract (Armantier & Boly, 2015; Aron & Olivella, 1994; de Quidt et al., 2017; Hannan et al., 2005). Other researchers including Bandiera et al. (2009), Fisher et al. (2004), Hossain and List (2009), and Lee and Rupp (2007) have chosen to study pay for performance through field experiments and have shown that there is a lot of autonomy when it comes to studying this subject through the analysis of both corporate companies and in factories. Other field experiments have been conducted in a classroom setting using different incentives such as grades in a class and also monetary incentives for teachers (Apostolova-Mihaylova et al., 2015; Duflo et al., 2012; Fryer et al., 2012; Podgursky & Springer, 2007).

While many studies testing the theory of pay for performance can be conducted using many different scenarios, lab experiments are also a way for researchers to test the same theory,

but control for certain variables that they believe show different effects. The use of lab experiments is most closely related to the study conducted in this paper. Lab experiments can be conducted in a multitude of different ways using many different subsets of populations. In many cases, researchers search to simulate real-life scenarios in which participants act as employees. Cadsby et al. (2007) manage to achieve this simulation in their laboratory experiment. In this experiment, undergraduate students are employed from an Australian university to complete an anagram word-creation game. This means that participants were asked to unscramble a set of seven letters to combine them into full English words. The level of performance was measured by the number of combinations that a certain participant could make. This paper asked subjects to participate in one practice round and eight "real" rounds of three minutes. The researchers conducted a pretest using ninety-nine business school students at a Canadian university to determine the average number of word combinations; 11 words was the median of this pretest, so this was used as the "target" number of combinations for their study. Participants were either placed in the bonus structure where they received \$0.20 per correct word or a fixed salary of \$2.20. The researchers find that using pay for performance offers two advantages; it attracts higher-quality candidates and employees and it incentivizes employees to exert more effort. Given that participants were able to choose between the fixed or pay for performance, 19 subjects decided to change from fixed salary to the pay for performance in the final rounds due to their success in previous rounds. These results show that a level of confidence was shown throughout participants towards the end of the experiment. This does not mean overconfidence, since if overconfidence was present, most people would self select into the pay for performance

group from the beginning, rather than the latter rounds. The confidence shown in this paper also has a direct effect on effort, which multiple other papers study in different ways.

Researchers including Brooks et al. (2012), Brügger & Strobel (2007), and Christ et al. (2012) focus their research on measuring effort as a result of different framing contracts within a laboratory setting. Brooks et al. (2012) base their research off of Hossain & List (2009); using their work to introduce new hypotheses that can be tested. In this paper, students from the University of Zürich were randomly assigned into either the main treatments of gain frame or loss frame or smaller groups of either loss expectation or loss endowment. As with many studies, this experiment was economically equivalent regardless of the group in which the student was placed. One fault of this paper is that students were not asked to complete a task to measure effort, instead there was a machine that produced different levels of effort from which the students had to choose their expected effort level. This fault means that the researchers weren't able to exactly pinpoint real human behavior and based it off of a machine. However, the authors found that students chose to select effort levels that awarded them with a bonus even though that meant they were not maximizing their profits. This means that students were more fixated on receiving a bonus rather than receiving the most money they possibly could. This concept of "chosen effort" has also been researched by Brügger & Strobel (2007), however combined with real effort tasks.

Brügger & Strobel (2007) choose to conduct two different laboratory experiments, one similar to that of Brooks et al. (2012) where subjects are asked to choose their effort levels and one where they are asked to perform specific tasks to gauge real effort. These two tasks are then compared to see if a subject's real effort matches their chosen effort. To gauge real effort, the

subjects are asked to multiply 2-digit numbers together in five minutes. For each correctly solved set, the participant receives a bonus of five ECU. After this task is complete, they are then asked to return for the second part of the study, which is the chosen effort portion. Subjects are randomly assigned to either the role of employer or worker and together, one employer and two workers are asked to complete the same multiplication task from the first experiment. The workers are then asked to choose their level of effort, however based on the number of correctly solved multiplication sets from both the first and second experiments, “if a participant solves 15 multiplications correctly in the first part of the experiment, and 11 multiplications in the second part, the participant delivers an effort level of 70%”. The main result found is that subjects within this study react similarly when different wages are offered between the real and chosen effort tasks.

Brüggen & Strobel (2007) were able to pinpoint differences between real and chosen in a laboratory setting, however Christ et al. (2012) attempted to find effects of effort through an incomplete contract setting. In this case, an incomplete contract setting means that not all tasks that the subject is asked to complete are counted within the contract frame they are given. In this study, participants are asked to complete two tasks; the first task is governed by the pay for performance model and the second task payment is at the discretion of the principal. The modeling and experiments uncover another mediating variable of trust; when using incomplete contracts, penalty contracts lead to lower levels of trust and therefore lower levels of effort on tasks.

In many cases, effort levels can intrinsically motivate a person to perform well on a task. Gneezy & Rustichini (2000) test whether the amount of money that is used as an incentive matter

to their subjects. In this experiment, the subjects were asked to complete 50 GMAT questions. These participants are split into different groups; no incentive, 10 cents, NIS 1, and NIS 3 which are different categories of payments. The researchers found that people are definitely incentivized by money, however it has to be a larger sum of money. The average number of correct answers reported were: no payment answered on average 28.4 correctly, 10 cents incentive answered 23.07 correctly, and those with higher incentives around 34 were answered correctly. This shows that with no payment, subjects answered more questions correctly than those subjects with a 10 cent incentive. However, with a larger sum of money used as payment, the number of correct answers increased significantly. This shows that while, yes, people can be incentivized to do well, that payment needs to be an amount that the participants value.

One gap in this literature is that many papers tend to focus on employees within the workforce and not students. However, college students are another set of the sample population who need to be motivated to complete tasks (either extrinsically or intrinsically), but are not incentivized through money. This paper studies how college students are motivated with the use of money to see if they, too, can be motivated to improve their performance on their various college assignments. This study looks at whether or not students can be extrinsically motivated through the use of incentives or if students work better through the use of their own intrinsic motivation. If they can be extrinsically motivated, it can help discern a way that these incentives can be used by professors and faculty at Gettysburg College and other colleges and universities around the country and world.

Method

The purpose of this paper concludes whether or not students react differently to incentives than employees in the workplace and to what degree college students can be motivated to increase their performance on college assignments. This study measures motivation through the number of correct answers depending on which payment scheme they are under. Effort is also measured through the use of a timing function, showing that the more time that is dedicated to answering the questions in the study, the more effort is exerted. There is also a measure of how much each participant values the candy through the use of a Likert Scale to gauge how much of an incentive candy is. Overconfidence is also measured by asking each participant at the end of study how many questions (out of 10) they believe to have gotten correct. Regarding these variables of interest I hypothesize the following:

H1: There will be no difference in performance levels between subjects in the bonus and penalty contracts.

H2: Effort levels, measured through the amount of time it takes to complete the study, will not differ between bonus and penalty contracts.

H3: Students will not express a preference to be compensated in candy.

H4: Students that have a preference to be compensated in candy will have higher performance levels.

H5: Students that have a preference to be compensated in candy will spend more time on the task.

The basis for these hypotheses stem from the literature and from the restrictions that Covid-19 has caused. I believe that there will be no difference in performance and effort levels between the two contract structures because the use of hypothetical candy is not an effective

form of compensation. Under the Covid-19 restrictions, real candy could not be used, however that would function as a more effective incentive. As shown in the literature, the use of money has universal value, however candy is not valued by all (de Quidt et al., 2017; Hannan et al., 2005). The fourth and fifth hypotheses stem from the literature, showing that if the value of the incentive is high, the participant will exert more effort and therefore, perform better on the task (Booth & Frank, 1999; Jensen & Murphy, 1990; Lazear, 1996; and Weber & Mayer, 2011)

I would also like to discern the difference between motivation and effort within this study. Motivation and effort are two different variables that are measured, however they have a positive relationship. Motivation stems from an incentive in this case, and effort stems from motivation. The ideal scenario would show that the use of candy as an incentive increases motivation, which increases effort, and therefore increases performance.

For the design of the study, the task for the participants is to answer ten quiz style questions at a grade five level. These questions consist of different subjects including science, math, English language/spelling, history, and geography. There is one control and one treatment group. For the case of this study, the control group is under the bonus contract. This means that compensation comes after the subjects have answered the questions in the study. For each correct answer, participants receive a piece of candy. The treatment group is the penalty contract. In this contract, participants receive the maximum number of pieces of candy before they begin the study and after they receive their score, candy is taken away based on the number of incorrect answers. For each incorrect answer, the participant loses one piece of candy. Each participant regardless of the control or treatment group receives two pieces of candy for participating in the study. They receive up to 10 more pieces of candy, representative of the 10 questions on the

quiz. Both payment schemes are economically equivalent. This means that if someone in the control group receives a 7/10 on the quiz, they receive another 7 pieces of candy. Similarly, in the treatment group, if a participant scores a 7/10, 3 pieces of candy is taken back. Both scenarios leave the participant with a total of 9 pieces of candy.

The participants of this study are college students aged between 18-22 at Gettysburg College. Being a college student at Gettysburg is the only criteria for this study. Since I have both a treatment and control group, this is a between-subjects design. This means that there are different people between the control and treatment group. This totaled 139 individual Gettysburg College participants. The control or bonus survey responses were 44.1% male and 55.9% female. Regarding class year, 29.4% was from the class of 2020, 47.1% from the class of 2021, 23.5% from the class of 2022, and 0% from the class of 2023. The treatment or penalty survey responses were 43.7% male and 56.3% female. In terms of class year, 43.7% was from the class of 2020, 29.6% from the class of 2021, 23.9% from the class of 2022, and 2.8% from the class of 2023. The end of the survey also asks the aforementioned questions regarding overconfidence, contract preference, and compensation preference. There are also questions about the participant's gender and year of graduation.

The nature of this study was supposed to be an in-person survey to be able to award the participants with their candy directly after the survey was completed. However, due to the Covid-19 circumstances, I cannot test people in-person and it is now a hypothetical survey. I used Google Forms to set up the questions in the same manner. However, I included in the instructions that the candy is now hypothetical, but for the participants to act as if the survey was in-person and that they were going to receive the candy as payment. Within the survey, the ten

quiz questions are measuring the degree to which the participant knows the information, but also the measure of motivation. The more motivated a participant is, the more they try to answer the quiz questions correctly. There are two questions: one before the quiz begins asking when they started the quiz and one at the end, asking what time they finished the quiz. These two questions gauges the amount of effort that was exerted. By using time to measure effort, I can directly link the two variables, showing that the more time elapsed, the more effort was exerted to answer the questions correctly. Then, a question is posed of how much each participant values the candy as a form of compensation. It is safe to assume that if the subject does not like candy, they are not incentivized to exert more effort or be more motivated than they are intrinsically to do well on the quiz.

The participants of this study are selected based upon the criteria that they are students at Gettysburg College. This can be replicated through any university or college and participants can be recruited in any way as long as they are college students. Instructions for consent and compensation methods are included in the appendix.

Results

To study both the control and treatment group, two surveys were used - one using a bonus frame and one using a penalty frame. In total, I estimate that the bonus survey was sent out to approximately 220 students and the penalty survey was sent to approximately 240 students. The bonus survey had 68 responses and the penalty survey had 71 responses. This shows a bonus survey response rate of 30.9% and a penalty survey response rate of 29.6%.

Discrepancies were also found relating to how long participants needed to complete the quiz between the control and treatment groups. For both, the compensation type was candy, which stayed constant through both groups. The average time it took to complete the quiz was 2.81 minutes between the 139 participants (Table 1). Participants in the bonus group averaged 2.69 minutes and participants in the penalty group, 2.96 minutes ($t(139) = -.97, p = .334$). The median and mode for both groups was 2 minutes, the minimum was 1 minute, and the maximum was 8 minutes.

Using the five hypotheses mentioned above, both Excel and SPSS were used to run different tests according to the hypothesis. The first hypothesis stated that there would be no difference in performance levels between subjects in the bonus and penalty contracts. To test this hypothesis, an independent samples t-test was used. The mean performance levels for the bonus and penalty contract were 8.03 and 8.2 correct answers, respectively. Performance levels did not differ between the bonus and penalty contracts, $t(139) = -.12, p = .991$, so we support our original hypothesis.

The second hypothesis predicted that effort levels will also not differ between the bonus and penalty contracts. Again, an independent samples t-test was used. The average completion times was 2.69 minutes in the bonus contract and 2.96 minutes in the penalty contract. Effort levels did not differ between the bonus and penalty contract, $t(139) = -.97, p = .334$, so we are again supporting our hypothesis.

Students were also hypothesized to not express a preference to be compensated in candy, which is shown in the third hypothesis. This test required a one sample t-test using candy

preference as the variable. The results show that students did express a preference to be compensated in candy, $t(139) = 6.48, p < .001$, showing that we do not support the hypothesis.

The fourth hypothesis predicted that students that value and show a preference to candy will have higher performance levels. A bivariate correlation was used to study this hypothesis. These two variables are significantly positively correlated, $r(137) = .207, p = .014$, which supports our original hypothesis.

The fifth and final hypothesis is similar to the fourth hypothesis. This one hypothesized that students who value and show a preference to candy will also spend more time completing the task. A bivariate correlation was also used to study this hypothesis. The hypothesis is not supported as there is no significant relationship between the two variables, $r(137) = .019, p = .828$.

Apart from the hypotheses, there are also differences between the bonus and penalty contracts, which can be shown using averages of predicted score and compensation preference, since all other variables were shown in the hypotheses. The predicted score in the bonus contract was 7.87 correct answers, whereas the penalty contract was 7.31 correct answers ($t(139) = 1.97, p = .05$). Regarding compensation preferences, the results were very different between the bonus and penalty contract. The compensation preference was rated on a scale from 1 to 10, with 1 being that the participant hated the compensation method and 10 being that they loved it. In the bonus contract, the average was 6.56 and the penalty contract average was 4.97 ($t(139) = 4.95, p < .001$). The averages of these variables clearly show the differences between participants in the bonus versus the penalty contract.

Gender differences were not defined in the original measurement variables, however the results show clear disparities (Table 1). The use of computing averages for variables such as, predicted score, actual score, time it took to complete the task, candy preference and compensation preference all show clear differences between gender. Overconfidence was measured in the survey using a question about how many quiz questions participants believed to have gotten correct. Between males and females, predicted correct scores averaged 8.02 for males and 7.26 for females ($t(139) = -2.78, p < .001$). The actual correct scores between males and females showed no difference, with both genders averaging an actual score of 8.13 ($t(139) = -.012, p = .991$). As stated, effort is measured through the time it took for each person to complete the study. The time completed averaged 2.66 minutes for males and 2.94 minutes for females ($t(139) = 1.13, p = .259$). Overall, women showed a slightly higher, though insignificantly different, preference for candy averaging a response of 3.60, whereas men averaged 3.47 ($t(139) = .747, p = .456$). These gender differences were not originally intended to be discussed, but the results show interesting disparities.

Discussion

The original research questions of this study was to determine if college students react differently to incentives than employees and to what degree can college students be motivated to increase their overall performance on their college assignments. The results show that students and employees do not react differently - both are easily incentivized regardless of their occupation and task. Additionally, college students can be motivated to increase their

performance on college assignments, however the degree can be better determined using money as the incentive.

The main conclusions found in this study stem from the original hypotheses. Participants in the bonus and penalty structure did not differ in performance levels or efforts exerted. Participants also showed a preference to be compensated in candy showing that incentives do not have to be money, but anything that is valued by the participants. This subset of college students also showed that those with a higher preference in candy spent more time completing the task, but did not have higher performance levels. This shows the link between incentives and increased effort, however higher performance levels were not induced by the incentive. The results also concluded that the compensation preference was higher in the bonus contract than the penalty contract. This parallels the literature, since this result shows that people generally enjoy being paid using the bonus contract as opposed to the penalty contract. This shows that they would most likely pick the bonus contract if they were being paid using a pay for performance model.

While gender differences were not originally intended to be measured, results paralleled the literature and found that, overall, men had a higher predicted score, which shows a level of overconfidence in males. The results showed no difference in actual scores between females and males, which again shows that women tend to be much less confident than men, but still score as well. In terms of effort and preference, women did not spend significantly more time on the task or showed a stronger preference to be compensated in candy.

Another gap found in the literature is the lack of measuring the value of the chosen incentive. Many of these experimental papers measured different variables such as effort, level

of disappointment, and loss or risk aversion. However, none of these papers asked their participants to rank how they value the incentive given to them. In the case of money or currency being used as an incentive, it is safe to assume that, universally, people are motivated by money. Everyone values currency to a certain degree because it gives people the means to sustain life. Given that people value money, it is also important to measure the degree to which it is valued. This can differ between people for many reasons, however it can also be a large factor of how much effort is exerted in these scenarios. Thus, measuring this variable can draw more narrow conclusions of how different contract frames affect different people. While it is very telling how employees react and are motivated by money, I found that it is possible for college students to be motivated through other incentives than money.

Through this research, there were certain limitations that arose that could have possibly skewed my data. First, the distribution between males and females was dominantly female in both surveys. While the distribution was close to the 50/50 split, it was not quite there, with a total of 61 males and 78 females between the two conditions. Additionally, as a senior, my data mostly consisted of upperclassmen participants. This detail could have skewed my data since upperclassmen are closer to finishing college and entering the workforce or because they have been in school the longest. As a result of being upperclassmen, they maybe have been more receptive to a pay for performance model. Both of these reasons could have skewed the data because they are not representative of the Gettysburg College population and must be amended in further research.

There are other questions that arose during the time conducting the study. This project also only employs students who attend a liberal arts college, which may lead to disparities

between this study and other studies conducted at other colleges and universities. Additionally, there could be a possibility that people in different majors are motivated differently, so measuring this could help solve that issue. As discussed in the literature, while most people can be motivated by money, the degree of that motivation can vary between income levels or socioeconomic status. While some false reporting could arise, the implementation of such a question about a participant's level of wealth could add more depth about motivation and value to help narrow the results. This type of question would, however, need to be implemented when using cash as an incentive and not candy.

Ideally, this study would have been conducted in person so that the experimenter could monitor the participant in person, time them, and also make sure that no internet, phone, or calculator was being used. Due to the current circumstances, the survey had to be sent out through the use of an online form. The purpose of this study is that participants can be monitored in a lab setting. The use of a survey opens many possibilities of unethical behavior, such as cheating. Participants could have looked up answers to questions online, used a calculator, or reported incorrect times that it took for them to complete the study. The value of candy could have also been more easily gauged by the use of body language and direction communication between the experimenter and participant. Additionally, dietary restrictions cause some people to not be able to eat certain candy. If the experiment were to be in person, the use of different varieties of candy would be employed so that the participant could choose their own type of candy. In that case, the overall value would have increased. This study was also supposed to have a third survey under a fixed rate payment structure, which would have been used as the control group. A fixed rate payment structure would be used to clearly articulate differences

between pay structures versus fixed rate structures to show whether or not pay for performance schemes overall increased productivity.

For future studies, I would first like to conduct the experiment as it was meant to be with candy as an incentive and college students being the participants. This would give a clearer picture and serve as the base to conclude whether or not candy is a successful incentive in increasing overall performance of college students. Another possibility with this study is to use cash as an incentive. As seen from the literature, students are rarely used to test the pay for performance theory, and if they are, the incentive is in the form of extra credit points, for example. Humans can be inherently incentivized by money and college students tend to be individuals who could use more money. Many students do not earn an income and if they do, it is most often a very small amount. The value that college students place on money would most probably be higher than that of an employee earning a six-figure salary. Through the use of money to incentivize college students, the conclusion could possibly prove that students can be as motivated by money as employees. Some countries around the world pay their students to go to school and the possible conclusions of this study could suggest that the money incentive increases both individual and overall performance. The implications of this means that if that study is successful, it could be used in an effort to start paying students for school, especially since school performance in the United States is lower than its potential and is something the government wants to improve.

Overall, it is clear both in the literature and the conclusions of this study that people are inherently more extrinsically motivated than intrinsically. The introduction of incentives has shown to increase overall performance in the workplace of corporate offices and factories and

also while testing college students. However, this paper shows that while the relationship between incentives and performance is strongly positive, evidence lacks in the measure of effort being induced by incentives to then increase performance. This study also concludes that incentives do not have to be money, but can also be in the form of candy. This leads to further conclusions that incentives can come in any form as long as the participants value whichever incentive is used. The theory of pay for performance holds true. Conclusions now show that incentives can be altered and that the theory also applies to participants outside of the workplace.

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Appendix A - InstructionsControl Survey/Quiz – Bonus Contract

Thank you for participating in this study. You will be asked 10 questions. Under the Covid-19 circumstances, I cannot ask these questions in person and provide you with compensation. Please keep these hypothetical instructions in mind and act as if you would be receiving compensation for this study.

You will receive 2 pieces of candy for participating regardless of how many questions you get correct. For each question you get correct, I will give you an additional piece of candy. If you give 6 correct answers, I will give you 6 more pieces of candy. If you score 10/10, I will give you 10 more pieces of candy.

Do not use the calculator or search the internet to arrive at your answers.

Please enter the time that you STARTED this quiz. _____

Name the American president who was assassinated in 1963.

- a. Abraham Lincoln
- b. John F. Kennedy**
- c. William McKinley
- d. James Garfield

The modern-day city of Istanbul was known by what name in the 13th century...

- a. Ottoman
- b. Turkey
- c. Constantinople**
- d. Bursa

English language/Spelling

The person in a novel who tells the story from a third-person perspective is called a what?

- a. The supporting character
- b. The narrator**
- c. The main character
- d. The author

What is the correct way to spell the word below?

- a. Handkercheif
- b. Hanekerchief
- c. Hankercheif
- d. Handkerchief**

Geography

In what country is the famous Taj Mahal located?

- a. Nepal
- b. India**
- c. Bangladesh
- d. Bhutan

What are the two official languages spoken in Canada?

- a. English and Spanish
- b. English and French**
- c. English and Mandarin
- d. Trick question: only English

Science

The Earth is at least how many billion years old?

- a. 12 billion
- b. 8 billion
- c. 2 billion
- d. 4 billion**

Circle the three states of matter from the options below.

- a. Solid**
- b. Heat
- c. Ice
- d. Gas**
- e. Evaporation
- f. Liquid**
- g. Putty

Math – Use the space below each question to determine the answer

NO USING A CALCULATOR A father has 7 daughters and 100 dollars. If he wants to give each daughter an equal amount of money, rounding to the nearest dollar, how much does each daughter get?

- a. 7
- b. 15
- c. 14**
- d. 21

NO USING A CALCULATOR Solve the following equation: $5 + 3 * 4 / 2 - 1$

- a. 15
- b. 8
- c. 17
- d. 10**

Please enter the time you FINISHED this quiz. _____

Follow-up on Study

On a scale of 1 to 5, rate how much you like to be compensated in candy.

1	2	3	4	5
Hated	Disliked	OK	Liked	Loved

How many questions out of 10 do you think you got right?

- 1. 1
- 2. 2
- 3. 3
- 4. 4
- 5. 5
- 6. 6
- 7. 7
- 8. 8
- 9. 9
- 10. 10

Did you like being compensated this way of being given an extra piece of candy for each correct answer?

1	2	3	4	5	6	7	8	9	10
I hate it									I love it

Gender:

- a. Female
- b. Male
- c. Other

Year:

- a. 2020
- b. 2021
- c. 2022
- d. 2023

Treatment Survey/Quiz – Penalty Contract

Thank you for participating in this study. You will be asked 10 questions. Under the Covid-19 circumstances, I cannot ask these questions in person and provide you with compensation. Please keep these hypothetical instructions in mind and act as if you would be receiving compensation for this study.

You will receive 2 pieces of candy for participating regardless of how many questions you get correct. Before you start the quiz, you will receive 10 pieces of candy. For each question you get wrong, I will remove a piece of candy from your pile. If you give 4 wrong answers, I will remove 4 pieces of candy. If you score 10/10, I will not remove any candy from your pile.

Do not use the calculator or search the internet to arrive at your answers.

Please enter the time that you STARTED this quiz. _____

Name the American president who was assassinated in 1963.

- a. Abraham Lincoln
- b. John F. Kennedy**
- c. William McKinley
- d. James Garfield

The modern-day city of Istanbul was known by what name in the 13th century...

- a. Ottoman
- b. Turkey
- c. Constantinople**
- d. Bursa

English language/Spelling

The person in a novel who tells the story from a third-person perspective is called a what?

- a. The supporting character
- b. The narrator**
- c. The main character
- d. The author

What is the correct way to spell the word below?

- a. Handkercheif
- b. Hanekerchief
- c. Hankercheif
- d. Handkerchief**

Geography

In what country is the famous Taj Mahal located?

- a. Nepal
- b. India**
- c. Bangladesh
- d. Bhutan

What are the two official languages spoken in Canada?

- a. English and Spanish
- b. English and French**
- c. English and Mandarin
- d. Trick question: only English

Science

The Earth is at least how many billion years old?

- a. 12 billion
- b. 8 billion
- c. 2 billion
- d. 4 billion**

Circle the three states of matter from the options below.

- a. Solid**
- b. Heat
- c. Ice
- d. Gas**
- e. Evaporation
- f. Liquid**
- g. Putty

Math – Use the space below each question to determine the answer

NO USING A CALCULATOR A father has 7 daughters and 100 dollars. If he wants to give each daughter an equal amount of money, rounding to the nearest dollar, how much does each daughter get?

- a. 7
- b. 15
- c. 14**
- d. 21

NO USING A CALCULATOR Solve the following equation: $5 + 3 * 4 / 2 - 1$

- a. 15
- b. 8
- c. 17
- d. 10**

Please enter the time you FINISHED this quiz. _____

Follow-up on Study

On a scale of 1 to 5, rate how much you like to be compensated in candy.

1	2	3	4	5
Hated	Disliked	OK	Liked	Loved

How many questions out of 10 do you think you got right?

- 1. 1
- 2. 2
- 3. 3
- 4. 4
- 5. 5
- 6. 6
- 7. 7
- 8. 8
- 9. 9
- 10. 10

Did you like being compensated this way of having a piece of candy taken away for each incorrect answer?

1	2	3	4	5	6	7	8	9	10
I hate it									I love it

Gender:

- a. Female
- b. Male
- c. Other

Year:

- a. 2020
- b. 2021
- c. 2022
- d. 2023

Appendix B - Tables and Figures

Table 1 - Descriptive Statistics

	Mean	Median	Mode	Standard Deviation	Min	Max	Mean Bonus Contract	Mean Penalty Contract	<i>t</i>
Predicted score	7.59	8	8	1.64	3	10	7.87	7.31	1.97 (.05)**
Actual score	8.13	8	9	1.45	3	10	8.03	8.2	-0.12 (.991)
Time completed	2.81	2	2	1.45	1	8	2.69	2.96	-.97 (.334)
Candy preference	—	Liked	OK	—	1	5	OK	Liked	6.48 (.001)***
Compensation preference	5.75	5	5	2.04	1	10	6.56	4.97	4.95 (.001)***

Note: p-values are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10