Earning Extra Credit or Losing Extra Credit? A Classroom Experiment on Framing Incentives as Gains or Losses

Vassilis Dalakas
*California State University San Marcos*, vdalakas@csusm.edu

Kristin Stewart
*California State University San Marcos*, kstewart@csusm.edu

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A Classroom Experiment on Framing Incentives as Gains or Losses

Vassilis Dalakas, California State University San Marcos, vdalakas@csusm.edu
Kristin Stewart, California State University San Marcos

Abstract – This exploratory study examines if the way incentives are framed (gains versus losses) impacts how students respond to them. Sixty-two students in two sections of the same undergraduate Marketing course were offered the incentive of an optional final exam by answering correctly quiz questions throughout the semester. One section received the incentive as a gain (opportunity to earn an optional final exam if you get enough quiz points) whereas the other section received it as a loss (final is optional, but you may lose it if you don’t get enough quiz points). Consistent with the principles of loss aversion, framing the incentive as a loss was more successful in motivating students in quiz performance. This study provides interesting insight to educators about rethinking how we frame incentives to our students.

Keywords – Extra Credit, Framing, Loss Aversion, Pedagogy, Rewards, Student Motivation

Introduction

Jimmy Connors, one of the greatest American tennis players, was the world’s number one player for 268 weeks, including a consecutive period of dominance from 1974 to 1977 that spanned 160 weeks. Connors was famous for his tenacity on the court, the man who would not quit. When he was asked to explain what motivated him to perform at that level, he stated simply: “I hate to lose more than I love to win” (Seaton, 2020).

The fact that the pain of a loss can be more motivating than the joy of a win is a central premise in Prospect Theory (Kahneman, 2011; Kahneman & Tversky, 1979), through the notion of loss aversion, i.e., the amount of pain felt for losing something is higher than the joy felt for gaining the same thing. This premise can be helpful for motivation in other contexts besides sports, like employers motivating their employees, brands motivating their consumers, parents motivating their children, or educators motivating their students.

Marketing professors, like all educators, seek ways to motivate students in their classes using incentives. Through the standard grading mechanism, students earn high grades through strong performance on graded assignments and low grades through poor performance on graded assignments. In some cases, professors offer extra credit (any activities for which students may earn something above and beyond the standard grade components of the course) as an additional incentive to encourage students to engage in desirable behaviors (Ackerman & Kiesler, 2007; Elbeck & DeLong, 2015; Tuzovic & Harmon, 2015). For example, professors may offer extra credit when students attend a guest speaker’s presentation on campus, when they attend a relevant event off-campus, or when they read additional readings and do additional assignments, etc. From a motivation perspective, all of the aforementioned extra credit opportunities are typically framed as a gain, assuming the joy of earning them will be enough to motivate students. However, loss
aversion suggests that offering them as potential losses may be more effective in motivating student behavior, a notion that has not been researched in marketing pedagogical research. Our research addresses this topic and intends to provide insight on how framing extra credit opportunities as gains or losses may have an effect of how they motivate students.

Interestingly, offering incentives may not always work in motivating the desired behavior (Noble & Phillips, 2004; Tuzovic & Harmon, 2015). Recent research has shown that it is often the framing, not the incentive itself that increases the likelihood desirable behavior will occur (Smith, 2015; Chung, 2015). In fact, the impetus for this study was the personal experience of one of the authors who found opportunities for earning extra credit to have little effect on motivating students to engage in desired behaviors. This study is an exploratory attempt at examining whether/how the framing of such extra credit incentives may play a role in how they motivate students. Consequently, we designed a classroom experiment where we framed the incentive in terms of gains or losses. While exploratory, our classroom experiment findings provide interesting insight into how educators can capitalize on loss aversion because of the role it may play to increase student motivation.

**Literature Review**

**Loss Aversion**

Loss aversion, introduced in Prospect Theory (Kahneman & Tversky, 1979) is a cognitive bias that suggests that people feel greater pain when they lose something than they feel joy for gaining the same thing. For example, most people would be more upset if they lost a $20 bill than they would be happy if they found $20. Accordingly, most people will be more motivated to avoid the pain of a loss than they would be to pursue the joy of a similar gain (Ariely, Huber, & Werternbroch, 2005; Brenner et al., 2007). Consequently, losses are weighted more heavily than gains. Not surprisingly, websites for insurance companies tend to highlight many unlikely but costly consequences that one would face without having insurance with the expectation it would activate one’s preference for avoiding such losses by buying insurance coverage (Outreville, 1998).

**Endowment Effect**

Research suggests the emotions underlying ownership also play a role. Because of the pain associated with giving something up, owners of an item tend to evaluate it more favorably than non-owners. This concept, known as the Endowment Effect, suggests that people ascribe more value to things merely because they own them (Thaler, 1980). Carmon & Ariely (2000) illustrated how ownership affects perceptions of value through an interesting study with Duke students who wanted to see their team in the NCAA Men’s Basketball Final Four and participated in the lottery to win Final Four tickets. The researchers asked students who won tickets how much it would take to sell their ticket. They also talked with students who participated in the Final Four ticket lottery but did not win tickets. In those cases, they asked them how much they would be willing to spend to buy one. After negotiating with each group, the differences in the perceived value of the Final Four tickets were staggering; students who had a ticket to the game agreed to sell it for an average price of $1,400, about eight times more than what students interested in buying were willing to pay ($170).
Similarly, in a study using coffee mugs, Morewedge and his colleagues (2009) confirmed that ownership plays an important role in our perceived value of an item. Often, what we own has also sentimental value for us besides just its functional value, so that it is more painful to lose something we have than it is joyful to earn the same thing. Therefore, overall, we explore whether:

*RQ1: Framing an incentive as a loss will be more effective in motivating students’ behavior than framing it as a similar gain.*

**Message Framing**

Prospect Theory (Kahneman & Tversky, 1979) describes ways people choose between alternatives that involve risk, where the probabilities of outcomes are known; it posits that people make decisions based on the potential value of losses and gains rather than the final outcome. Thus, people evaluate these losses and gains using certain heuristics where losses are said to be more salient than gains. This effect extends to the framing of a situation in addition to the situation itself. In one study, where college-aged female subjects were presented one of four treatments (i.e. a loss-frame pamphlet, a gain-frame pamphlet, a pamphlet with no argument, or no pamphlet) to affect their likelihood of performing a health exam regularly, subjects presented with the loss-frame pamphlet reported they had actually performed the exam a greater number of times during the 4 months since their laboratory participation (Meyerowitz & Chaiken, 1987). Framing an incentive as a loss implicitly suggests students own the incentive and must work to keep it; on the other hand, framing an incentive as a gain suggests students do not own it and must work to obtain it. Thus, the former framing is positioned to activate an endowment effect as well as to provide motivation to avoid the pain of losing the incentive, but the latter framing is not. The literature on message framing regarding health behavior suggests that loss-framed messages are most persuasive or motivating for behaviors with probabilistic or uncertain outcomes, in which one risks an undesirable result (which is applicable in our case in terms of taking a final exam where you could do well or fail) (Apanovitch, McCarthy, & Salovey, 2003). Therefore, we more specifically propose that:

*P1: Participants that are presented with an incentive framed as something to lose will make more attempts to meet the goal than participants that are presented with the same incentive framed as something to gain.*

*P2: A greater number of participants that are presented with an incentive framed as something to lose will succeed in attempting to meet the goal than the number of participants that are presented with the same incentive framed as something to gain.*

**Extra Credit as an Incentive in Education**

The notion of extra credit in education is sometimes controversial (in the sense that it may excuse or even encourage poor performance in regular assignments) but is also quite a common practice among educators (Haber & Sarkar, 2017). Theoretically, participation in extra credit activities may serve to motivate a deeper exploration of academic topics (Kelly, 2019, Norcross, Horrocks, & Stevenson, 1989). However, typically it is the students with higher grades who are more likely to complete extra credit assignments (Harrison, Meister, & LeFevre, 2011), as well as those who are motivated to do well in the course, compared to those who are not or with lower grades; even though the latter are the ones who need it more. Though many students seek extra credit merely to improve their grade (Padilla-Walker, 2006), educators who use it should aim to
do so to improve student learning performance and increase motivation towards the course material (Norcross et. al., 1989).

Past research that focused on how students view extra credit compared to other coursework suggests that students’ perceptions of extra credit matter (Ackerman & Kiesler, 2007). From their study, Ackerman and Kiesler (2007) conclude, “student demands for extra credit may be an excuse for poor performance as some have suggested, but when delegation of it is in the hands of instructors and the opportunity for extra credit is given to all students, extra credit assignments seem to benefit both students and instructors” (p. 123). Clearly more work is needed to improve upon the use of extra credit in classrooms. The framing propositions of this research are intended to provide insight on how to improve extant use of extra credit, the incentive on which this research focuses.

**Method**

Data were collected from undergraduate students at a mid-size public university in the west region of the U.S. To ensure consistency in the design, the sample consisted of students in two different sections of the same Marketing undergraduate course offered at different times by the same instructor. The course was a required course for Marketing majors. Students in both classes were given pop quizzes on the assigned readings. However, they were not required to take these quizzes, making them essentially an option equivalent to “extra credit.” If they chose to take a quiz and they answered it correctly, they would earn a point. If they collected five points over the course of the semester, they would be able to opt out of the final exam if they wanted. In an effort to discourage students from simply guessing when taking the quiz, if the students took a quiz and answered it incorrectly, then they would lose a point and fall behind in their effort to get to the five points needed for opting out of the final exam.

**Procedure and Sample**

In the first class, the syllabus stated that the final exam was required but students could earn the right to not take it with five points from the quizzes, similar to how extra credit incentives are typically framed in a classroom setting. In the second class; however, the syllabus stated that the final exam was optional, but students could lose that right if they did not get five points from the quizzes. (See Appendix for wording used in both conditions). In both classes, students were required to accomplish the same goal (receiving five points from the quizzes) and their rewards for doing so were identical (opting out of the final exam) in both classes. However, the offer was framed either as a potential gain (earning the right to an optional final) or a potential loss (losing the right to an optional final). The instructor ensured to use this language consistently in each class throughout the semester when the quizzes were given and when there was any discussion with students from either class about this activity.

The first class had 35 students (54% female) and the second class had 27 students (48% female) and there were 12 quizzes given in each class. Data were collected on how many students took each quiz and on each student’s progress throughout the semester. Each correct quiz was worth 1 point, each untaken quiz was worth 0 points and each incorrect quiz was worth -1 points.
Findings

In order to explore our overall question and first proposition, which states that the framing (gain opt out of mandatory final vs. lose optional final) will be associated with how many times students’ attempt to reach the goal, an independent samples t-test was conducted. The outcome variable assessed was the sum of quizzes each student tried. This sum was expected to be higher for the loss (vs. gain) condition. Results from the t-test did not support P1, \( t(60) = 1.39, p = .169 \). Specifically, students in the loss condition (\( M = 5.56, SD = 4.71 \)) did not try significantly more quizzes than those in the gain condition (\( M = 4.71, SD = 2.54 \)).

However, the relationship between framing and the number of quizzes attempted was more noticeable when comparing the sum of successful quiz attempts by each student (e.g., correct quizzes earning 1-point) between the two conditions (Figure 1). Results from the t-test supported P1, \( t(59.23) = 3.35, p < .01 \). Specifically, students in the loss condition (\( M = 4.37, SD = 1.52 \)) had an average of 1.60 more successful attempts than those in the gain condition (\( M = 2.77, SD = 2.22 \)).

Figure 1. T-test Test Results of the Number of Quizzes on Average Students Earned Points For

![T-test Test Results of the Number of Quizzes on Average Students Earned Points For](image)

To further explore P2, whether students in the loss condition would be more successful in reaching the goal (i.e., 5 quiz points) than students in the gain condition, the data were recoded. If students received 5 points (i.e., met the goal), they were given a code of 1. If they did not receive five points (i.e., failed the goal), they were given a code of 0.

A Chi-Square analysis was applied to a contingency table, with a Cramer’s V test. This analysis explores whether or not a statistically significant relationship exists between students’ getting five points and the incentive frame they received (e.g., gain vs. loss). Cramer’s V test tells
the strength of a relationship. According to the results, the hypothesis was supported (Figure 2). The percentage of participants that obtained 5 points differed significantly by incentive frame, $X^2(1) = 9.449, p < .01$. In particular, more students in the loss condition met the goal in passing five quizzes (81.5%) than failed the goal (18.5%). Additionally, more students in the gain condition failed the goal in passing five quizzes (57.1%) than met the goal (42.9%). Moreover, more students in the loss condition met the goal in passing five quizzes (59.5%) than students in the gain condition (40.5%). According to the Cramer’s V test ($V = .390, p < .01$), performance is moderately associated with incentive frame.

The above analysis is of data collected on students’ accomplishing the goal of five quiz points in order to gain/lose the chance to not take the semester final exam. Overall, the analysis supported that framing the incentive as a loss rather than a gain would be more successful in motivating students. Fewer than half (43 percent) of the students in gain condition collected the necessary five points. Almost twice as many (82 percent) of the students in the loss condition were successful in completing their five points.

In order to test if the aptitude or work ethic of the students in one class versus the other could be a confound, an independent samples t-test was conducted. The results suggest there was no significant difference ($t(60) = 0.00, p = .50$) between the average course GPA for the first class ($M = 2.67, SD = 1.17$) and for the second class ($M = 2.67, SD = .94$). This eliminates GPA as a concomitant factor and enhances the robustness of the above results.

![Figure 2. Chi-square Test Results of How Many Students Completed the Extra Credit](image)

**Discussion, Implications and Future Directions**

This research explores the impact of how an incentive is framed on students’ behavior. The incentive examined was an opportunity for not taking the final exam tied to a behavior—complete a number of quizzes relating to the readings—that was designed to increase the students’ engagement with the class material. While typically such an opportunity would be framed as “pass
a certain number so that you can gain the reward”, theory suggests that framing it as a loss should evoke stronger responses than framing it as a gain. The findings of our research support this loss-based framing, as more students who received the loss frame were successful at completing the requisite number of quizzes to receive the reward the than those who received the gain frame. Not only did more students meet the goal of passing five quizzes, but the average number of quizzes attempted and passed by students who received the loss frame was higher than that of students who received the gain frame.

**How to Frame Extra Credit**

As loss aversion suggests, the disappointment for losing the optional final would have been higher than the excitement for earning it. The motivation of the students in the two classes seems to have been affected accordingly. Consistent with the premises of the endowment effect, having “ownership” of the right to an optional final made these students perceive it as more valuable than their counterparts who did not have it. Consequently, it increased their motivation to do what was necessary to not lose it.

At the end of the semester, the instructor debriefed all students in both classes and asked for their thoughts. None of the students in either class indicated they knew about the framing difference between the two sections. Comments from students in the loss condition confirmed that the idea of losing something helped with motivation. (“I didn’t want to give it up,” said one student referring to having the right to the optional final while his classmates nodded in agreement.) On the other hand, students in the gain condition who did not complete enough quizzes to earn an optional final admitted that the reward sounded appealing but they were used to having to take final exams in their courses, so ending up having to take one in this class, too, did not seem as costly. While informal, this feedback from the students confirmed that several of them assigned higher or lower value to the reward depending on whether they might lose it or must earn it.

Therefore, professors may need to consider this alternative where they offer extra credit opportunities as a reward that everyone receives but then take it away from those who did not engage in the desired behavior to keep it. Our findings suggest that this approach could work well for incentivizing tasks where the options are primarily about either engaging in and completing the desired activity or not. It would be more challenging to incorporate loss framing to incentivize tasks where different levels of performance will occur (e.g., a standard exam or a client-based project). Certainly, more research on this approach can contribute to the conversation on how to improve students’ motivation. Moreover, incentives with little risk associated with the implications (Meyers-Levy & Maheswaran, 2004) or lack of involvement with the task or issue (Maheswaran & Meyers-Levy, 1990) may not be conducive for this type of approach. Consequently, educators should choose tasks or situations where students have some stake in it.

**How to Design Extra Credit Activities**

In order for educators to capitalize on loss framing in their classrooms, they should incorporate extra credit activities that a) contribute to learning, b) are binary in the sense that they are either completed or not, and c) offer incentives that are of meaningful value. For example, business educators might have students attend a series of talks by business professionals in the community. They can do a total of 5, and each one they complete is worth a total of 1-point extra credit on their final exam. For this basic task, the professor would frame the assignment a certain way in their syllabus and in their explanation to the student. Instead of the typical “gain bonus points on your exam” that is typically used, we suggest the following language, supported by our
research findings, “Attend five talks by business professionals in the community so that you do not lose the allocated 5 extra credit points on your final exam.” With this framing, professors must frame their own syllabus to allocate extra credit rewards at the beginning of the semester and tie losing this allocation to not engaging in the desired behavior.

On the other hand, educators might consider an extra credit assignment such as: “watch the Super Bowl and share which one was your favorite ad”. Though this meets the recommended criteria of being binary and contributing to learning by engaging students in industry experiences related to class material, it may not be likely to be worthy of an incentive meaningfully valuable to the student. Of course, this decision is up to each instructor in terms of determining what the value of the extra credit activity is in relation to the reward that the students may earn or lose (depending on the framing).

Limitations and Future Research

Given this was an exploratory study, we need to take into account its limitations. The total sample from the two classes consisted of 62 students; therefore, caution should be exercised regarding generalizability of the findings. However, the alignment of our results to the well-established notion of loss aversion and the endowment effect lead us to conclude the findings of this study are robust. Additionally, the field experiment nature of the work enhanced its external validity but created challenges in terms of internal validity. Future research should seek to replicate the present findings using more participants, possibly by examining more sections at one time, or in larger classes randomly assigning students within the same class to different groups. Also, other information like students’ age or GPA should be included to examine possible confounding effects.

The mechanisms of motivation and effort were not directly assessed, and consequently are not directly spoken to in the results. Instead, the authors offer the findings only as suggestions about what might be occurring with respect to the actual motivation and effort of the students. Further research assessing effort and motivation directly would enrich the insights offered by this study. In addition to the finding that framing an incentive as loss is more effective than framing it as a gain, this study also suggests that an incentive framed as a gain may even have a demotivating effect on some students. While the majority of students in the loss frame condition completed the task, the opposite was true for the gain frame condition. Loss aversion suggests that loss is more salient than gain in motivating behavior, but little is said about possible demotivating effects of incentives presented as gains. Though incentives are intended to improve performance or motivate desired behaviors, it is possible that some incentives can lead to decreased productivity (Gubler, Larkin, & Pierce, 2013). Further investigation into the motivating (or demotivating) effects of gain-framed incentives is warranted.

Also, this research examined an outcome where there was some uncertainty as to whether the students would meet the requirement needed to qualify for the extra credit, but did not examine outcomes where the result is more certain (e.g., complete a single task and receive a reward, or turn in a single assignment for completion and earn credit). Theory suggests that in these situations, gain frames might work better (Tversky & Kahneman, 1981). Therefore, future research examining both gain and loss frames in situations of more versus less certainty will provide useful insight.

Overall, although this research includes a single study, it offers a significant contribution by starting the conversation for marketing educators that challenges the dominant way in which we frame and design incentives in our classrooms. Extra credit is just one incentive at an educator’s
disposal. Future research should expand upon this, examining other types of incentives beyond that of extra credit. For example, research might examine the framing of incentives to enhance attendance or class participation.

Educators know that cultivating conditions that allow all students to thrive in school require hard and deliberate work. The implications of our findings align with this: be deliberate in framing incentives to motivate desired behavior.

References


Appendix

1) Wording used in gain condition syllabus

Please note that the final exam is **required**! However, all students have the opportunity to earn the right to an optional final exam. In order for a student to **earn the right to an optional final exam**, he or she must collect five points from pop quizzes on the readings. Multiple such quizzes will be given during the semester. Answering a quiz correctly gives the student one point, answering it partially correctly or incorrectly equals minus one point, and not taking the quiz equals zero.

All students who earn the right to the optional exam will have the option of taking the letter grade that corresponds to the percentage of their earned class points up until the end of the semester if they want to.

2) Wording used in loss condition syllabus

Please note that the final exam is **optional**! In order for a student to **not lose the right to an optional final exam**, he or she must collect five points from pop quizzes on the readings. Multiple such quizzes will be given during the semester. Answering a quiz correctly gives the student one point, answering it partially correctly or incorrectly equals minus one point, and not taking the quiz equals zero.

All students who don’t lose the right to the optional exam will have the option of taking the letter grade that corresponds to the percentage of their earned class points up until the end of the semester if they want to.