

Influencing Positive Student Behaviour Using the Endowment Effect

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Abstract

Educators are constantly searching for methods to enhance student engagement. This study capitalizes on the endowment effect to increase student engagement. The endowment effect is a concept from behavioural economics that suggests individuals' value something that they possess more than a similar item that is not possessed. To test the endowment effect, students in some sections are offered extra credit points for engaging in out-of-class activities while others are endowed (gifted) extra credit points that they must work to keep. The findings are that students endowed with points work harder to keep them, and this effect is especially pronounced among females and high performing students at significance levels of 1%. By making a simple no-cost change to the structure of a class, educators can tap into the power of the endowment effect to significantly enhance student engagement.

Key words: *Endowment effect; student engagement; gender differences; extra credit.*

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Introduction

Pedagogical techniques to increase student learning and retention are perennial topics in the scholarship of teaching and learning literature. Medlin and Faulk (2011) find that student engagement is an important factor to accomplish these activities. One common method of increasing student engagement is to offer extra credit points for activities which can increase the level of learning or aid in the student's professional development. The role of extra credit has received attention in the literature as it is claimed to reinforcing learning goals in the classroom and even motivate students to attend activities that they might not otherwise experience (Dunn & Halonen, 2019). Traditionally, extra credit is offered for activities that extend beyond regular classwork. Students accrue points beyond their classroom points if they complete or attend these incentivized activities. This study seeks to capitalize on the phenomena known as the *endowment effect* by reversing the traditional approach of assigning extra credit activities.

In this study, students were given (endowed with) extra credit points at the beginning of the semester, and those points were taken away if they failed to attend a specified set of activities. The is aimed at showing that this change to the structure of the class has substantial effects on the behaviour of students. The remainder of the paper is organized as follows. First, the background literature surrounding student engagement and the endowment effect is explored. Next, the null-hypotheses of the study are developed, followed by the methodology. Finally, the results are presented, and the conclusions and avenues for future research are discussed.

Literature Review

Student engagement is a complex concept which measures the degree to which students are involved in the learning process. Arjomandi et al. (2018) found that increased engagement has a strong positive relationship with increased personal and professional skills in non-traditional students. Kahu (2013) proposed a comprehensive framework for student engagement which includes three types of engagement, as well as antecedents and consequences. The three types of engagement are affective, cognitive, and behavioural (Fredricks et al., 2004). The level of engagement is theorized to be impacted by structural and psychosocial influences. This study focuses on the effect of psychosocial influences on behavioural engagement via the introduction of the endowment effect. Psychosocial influences include actions on the part of, and relationships with teachers as well as student attributes such as motivation and self-efficacy. Behavioural engagement is measured by the actions students take that are of educational value both in and out of the classroom (Arjomandi et al., 2018).

Thaler (1980) proposed that individuals will value something they possess more than something of similar objective value that is not possessed. He suggested that when someone possesses a good, giving it up is seen as a relatively large loss while receiving the same item is perceived as a relatively smaller gain. Kahneman and Tversky (1979) succinctly stated that 'the aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount' (279). This phenomenon that losses are felt more sharply than gains is known as the endowment effect. The endowment effect is the generalized notion that people who own a good or item have a tendency to value it more than people who do not. The literature surrounding the theoretical underpinnings of the endowment effect spans a number of years and explores multiple underlying reasons (see: Festinger, 1957; Thaler, 1980; Kahneman et al., 1990; Kahneman et al., 1991; Tversky & Kahneman, 1991; Beggan & Scott, 1997; Bordalo et al., 2012).

The research testing the existence and magnitude of the endowment effect falls into two general paradigms, the exchange paradigm and the valuation paradigm (Morewedge & Gliblin, 2015). In the exchange paradigm, individuals are endowed with an item and then asked if they would trade that item for an item of similar value. Given the items are of similar value, standard utility theory would suggest trade would occur roughly 50% of the time, however, research suggests that trades tend to occur only 10%-15% of the time (Knetsch, 1989; Knetsch, 1995; List, 2004). In contrast to the exchange paradigm, the valuation paradigm endows some (but not all) participants with an item. Those who are endowed with the item are asked how much they would be willing to accept to sell the item while those who are not endowed with the item are asked how much they would be willing to pay to acquire the item. The gap between willing to accept and willing to pay ranges from 2:1 for easily substitutable goods (e.g. a chocolate bar and a mug) to 10:1 for non-market goods that have few or no substitutes (e.g. clean air/water) (see: Hammack & Brown, 1974; Knetsch & Sinden, 1984; Kahneman, et al., 1990; Kachelmeier & Shehata, 1992; Carmon & Ariely, 2000; Morewedge & Gliblin, 2015). The endowment effect has been found to be stronger in these situations if the owner can identify with the item (Tom, 2004), it has been owned a long time (Strahilevitz & Lowenstein, 1998), or was received as a reward (Lowenstein & Issacharoff, 1994).

The vast majority of these studies are conducted in a laboratory setting where the subjects are either endowed with an object or not simply because they are a participant in an experiment. One study that breaks away from this design to test the endowment effect in an empirical setting took place in a Chinese electronics factory (Hossain & List, 2012). Employees performed their work in teams and were offered the exact same bonuses framed in different treatments. In the punishment treatment, the employees were endowed with a bonus that was subsequently taken away if they failed to meet an end-of-week performance goal. In the reward treatment, the employees were told that they would receive a bonus if they met the same end-of-week performance goal. Hossain and List (2012) found that the punishment (endowment) treatment outperformed the reward treatment in five of six teams, increasing productivity by an average of 1% with no decrease in quality as measured by defect rate.

This study was designed similarly to Hossain and List (2012) in that it is not a laboratory experiment, rather it is a classroom setting. Whereas in the Chinese electronics factory the livelihoods of the participants were impacted due to changes in pay, in this study students' grades could be impacted by the amount of extra credit they accrue. Based on the vast amount of support for the endowment effect, it is expected that students who are endowed with bonus points will outperform students who are not endowed with the bonus points by attending more events and finishing the semester with more bonus points.

Null-hypothesis 1: There will be no relationship between endowing bonus points and points earned.

Alternative Hypothesis 1: There is a relationship between endowing bonus points and points earned. Following the above literature, we hypothesize that the endowment effect will motivate students who are endowed with bonus points to work harder to keep the points than students who have to work to earn the same bonus points.

Null-hypothesis 2: There is no difference in the endowment effect between men and women.

Alternative Hypothesis 2: There is expected to be a difference in the endowment effect between men and women. There has been some research suggesting that there may be a difference between men and women regarding the endowment effect. In experimental settings, Dommer and Swaminathan (2013) and Wieland et al., (2014) find that men and women react differently to the endowment effect.

Null-hypothesis 3: The magnitude of the endowment effect will not differ with the aptitude and performance level of the student.

Alternative Hypothesis 3: The magnitude of the endowment effect will differ with the aptitude and performance level of the student. Just as we hypothesize that men and women may react differently to the endowment effect, we hypothesize that student reaction to the endowment effect may differ across varying levels of student academic aptitude and performance.

Methodology

The study was conducted in seven course sections of two different upper-level business courses (Organizational Behaviour and Human Resource Management) at a mid-sized regional institution in the mid-south region of the United States. The same three extra credit opportunities to help students with professional development were offered in both semesters. The first event is Professional Development Day, which is a series of one-hour seminars led by business and community leaders focusing on topics such as networking and transitioning from school to the workplace. In the traditional (non-endowed) framework, students earn five extra credit points for attending one seminar, 12 points for attending two seminars, and 20 points for attending three or more seminars. The second event is a student-alumni roundtable that provides students an opportunity to network with alumni from the College of Business. The third event is a collegiate ambassador board financial literacy event. Students earn 10 bonus points each for attending the roundtable and financial literacy event. Students are limited to a grand total of 30 bonus points for the semester, which amounts to 6% of the total points available in the courses.

To test the impact of the endowment effect, the opportunities for extra credit were presented to the students differently in the spring semesters of 2016 and 2017. In the spring 2016 semester, the students were provided the traditional method of extra credit with the students earning extra credit points for attending the event. In the spring 2017 semester, students were notified on the syllabus and in class that they were endowed (given) 30 extra credit points. Furthermore, they were informed that they would have to attend the above-mentioned events in order to keep their bonus points. If they did not attend the events, their bonus points would be taken away from them. In this framework, the 2016 students were offered points in the traditional manner and serve as a reference or control, while the 2017 students are the endowed treatment. Table 1 provides a glimpse of the 240 students who finished the course with a grade between A-F. Students that withdrew from the class were excluded from the sample due to the extra credit events occurring at various times through the semester. We find that there is no significant differences in the means between the courses based on Total Course Points, GPA and ACT.

Table 1:
Summary Statistics

Variable	No Endowment	Endowment
Number of Students	112	128
Total Course Points	397	395
Extra Credit Points	10.2	14.5
GPA	3.08	3.10
ACT	22.6	23.4

Note: All values reported are averages (except number of students). Total course points excludes any extra credit points earned by the student.

Results

Table 2 provides the mean number of extra credit points earned in the non-endowed and endowed groups. Students who were endowed with the points kept 14.50 points while the students who earned the points as the semester progressed earned only 10.19. This statistically significant 4.31 point difference between the two treatments indicates that students earned 42.3% more extra credit points in the endowment group compared to the non-endowed group. These results provide evidence to reject null hypothesis 1 in favour of alternative hypothesis 1, the endowment effect does incentivize students to work harder than their non-endowed peers.

Table 2:
Total Points Earned

	No Endowment	Endowment	Difference	p-values	Observations
Classes	10.19	14.50	4.31	0.001	240

Note: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold.

Hypothesis 2 addresses the findings in the literature that there is a difference in the way men and women respond to the endowment effect. Table 3 confirms that there is a large and statistically significant difference in how male and female students react to the endowment effect. Females showed a statistically significant increase of almost six points (a 57.2% increase) earned in the endowment treatment when compared with the non-endowed classes while the males showed no significant difference.

Table 3:
Endowment Effect/ Gender

	No Endowment	Endowment	Difference	p-values	Observations
Male	10.00	12.68	2.68	0.133	127
Female	10.42	16.38	5.96	0.003	113

Note: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold.

Table 4 compares the points earned by males and females in each treatment. While female earned more extra credit points in both treatments, the difference between males and females in the non-endowed group was not significant. Thus, females earning 3.7 point more than (a 29.2% increase) their male colleagues when subjected to the endowment effect. These results provide evidence to reject null hypothesis 2 in favour of alternative hypothesis 2 and are in direct contrast to the findings of Apostolova-Mihaylova, Cooper, Hoyt, and Marshall (2015). In their 2015 study, Apostolova-Mihaylova, et al. test the impact of loss aversion using 171 college students. While their results did not support the endowment effect as a whole, they did detect a significant gender effect. In particular, they found that male students responded to the endowment effect while female students did not. Our findings are in direct opposition to this, with the endowment effect being statistically significant for females and not males.

Table 4:
Endowment Effect/ Treatment

	Male	Female	Difference	p-values	Observations
No Endowment	10.00	10.42	0.42	0.822	112
Endowment	12.68	16.38	3.70	0.048	128

Note: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold.

Hypothesis 3 addresses the difference in the endowment effect based on student performance and aptitude. The hypothesis is addressed by examining the data in a number of ways. First, the sample of students is divided into thirds based on how well each student performed in the class as measured by their end of semester point totals (excluding extra credit points). As table 5 indicates, the highest performing students earn more than twice as many extra credit points in the endowment treatment compared to the non-endowed treatment, and this difference is statistically significant. This effect persists (to a lesser, but still statistically significant degree) for students in the middle third of the point distribution. Surprisingly, students at the bottom of the distribution do not show a statistically significant change between the two treatments.

Table 5:
Endowment Effect/ Point Split

	No Endowment	Endowment	Difference	p-values	Observations
Bottom	11.97	11.64	-0.33	0.883	80
Middle	10.33	14.84	4.51	0.052	80
Top	8.26	17.00	8.74	0.000	80
All Students	10.19	14.50	4.31	0.001	240

Note: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold.

Another way to divide the students is by course grade. Table 6 shows how students reacted to the endowment based on what their final grade in the course would be without extra credit. These results are consistent with the results from Table 5, indicating that students with higher grades tend to respond more strongly to the endowment effect than students with lower grades. Students who would have received an A earned nearly 154% more extra credit points in the endowment treatment as compared to those A students who were not endowed. This represents almost 4% of the total points available for the class.

In the non-endowed classes, the number of extra credit points earned declined as grade increased. A students earned fewer bonus points than B students, who earned fewer bonus points than C students, who in turn earned fewer bonus points than D/F students. This trend is almost completely reversed in the endowed group, with A students earning the most extra credit points and D/F students earning the least. This indicates that the endowment effect has a much stronger effect on high performing students, and that effect diminishes as performance decreases. There was no significant difference between the two treatments for students who earned a D or F suggesting there is no evidence that they were motivated by the endowment effect.

Table 6:
Endowment Effect/ Class Grade Split

	No Endowment	Endowment	Difference	p-values	Observations
D/F	12.00	9.96	-2.04	0.506	43
C	10.95	15.21	4.26	0.060	77
B	9.80	14.85	5.05	0.027	87
A	7.31	18.59	11.28	0.005	33
All Students	10.19	14.50	4.31	0.001	240

Notes: This is the grade that would have been earned with a ten point scale and no extra credit. P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold.

In addition to analysing the data based on measures of in-class performance, the data was analysed by the overall academic aptitude of the student as measured by ACT score and GPA prior to the start of the semester. Students were divided into three categories based on their performance on the ACT. Table 7 portrays a similar story to the two previous analyses based on class performance. Students in the top and middle third of ACT scores have strong and statistically significant responses to the endowment effect, while students in the bottom third did not. An interesting finding is that students who fell into the lowest ACT category earned the highest amount of extra credit points, even though there was no significant endowment effect for that group. Perhaps low performing students are more likely to pick up the extra credit points to make up for their lack of performance on actual course work.

Table 7:
Endowment Effect/ ACT Split

	No Endowment	Endowment	Difference	p-values	Observations
Bottom	12.12	13.84	1.72	0.547	64
Middle	7.52	13.18	5.66	0.033	59
Top	9.60	13.70	4.10	0.100	62
All Students	10.19	14.50	4.31	0.001	240

Notes: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) in bold. Students classified as Bottom have ACT scores below 21, Middle have scores of 22-24, and Top have scores above 25. Students with no ACT were excluded from the analysis.

Similar to table 7, table 8 displays the results of the endowment effect by cumulative GPA prior to the start of the academic semester in which the class was taken. When examining the endowment effect by GPA, only the top third of students exhibited a statistically significant (and positive) endowment effect. These top students earned nearly twice as many extra credit points in the endowed classes when compared with the non-endowed classes. While the students with middle and bottom tiered GPAs did earn more points in the endowed treatment, the differences were not statistically significant.

Table 8:
Endowment Effect/ GPA Split

	No Endowment	Endowment	Difference	p-values	Observations
Bottom	11.22	12.33	1.10	0.614	80
Middle	10.21	13.64	3.43	0.140	80
Top	9.23	17.76	8.53	0.001	80
All Students	10.19	14.50	4.31	0.001	240

Notes: P-values are from the paired two-tailed t-test, with statistically significant results (at the 10% level) bolded. Students classified as Bottom had GPAs below 2.821, Middle had GPAs between 2.821- 3.391, and Top had GPAs 3.4 and above before enrolling in the class.

Taken as a whole, the data suggest the lowest performing students did not experience an endowment effect while the highest performing students did. These results provide evidence to reject null hypothesis 3 in favour of alternative hypothesis 3. We find that the magnitude of the endowment effect does differ with the aptitude and performance level of the student. This presents a challenge to the educator. If the endowment effect is not enough to motivate the students who need it the most other methods are needed to influence the poorest performing students. That being said, it is important to note that the endowment effect was not detrimental to any group of students. All groups demonstrated a positive response to the endowment effect but not all were statistically significant. There were no groups that demonstrated statistically significant negative responses to the endowment effect. Thus, introducing the endowment effect into a class causes no harm to any group.

Discussion and Conclusion

The results of this study provide evidence to reject all three null hypotheses in favour of the alternatives. We demonstrate that the endowment effect exists, that it has a stronger effect for female students than for male students, and that it has a stronger effect on high performing students than low performing students. Students in the endowed treatment earned 42.3% more points than the non-endowed students. In addition, female students earned 57.2% more points when endowed as compared to non-endowed females, and 29.2% more points than their male colleagues when endowed. Finally, students in the top levels of the academic ranks earned substantially more points when subjected to the endowment effect. Taken as a whole, these findings suggest that educators can make a simple, no-cost change to the structure of a class to increase the engagement of the students through the use of the endowment effect.

The goal of offering extra credit was to increase the professional skills of students which has been a concern for stakeholders in the local business community. According to Kahu's (2013) model, increased engagement will have many other positive effects including increased academic achievement, higher student motivation and satisfaction, and greater student retention. All of these potential outcomes are highly desirable and are potentially positively impacted by the endowment effect.

These results suggest other avenues to pursue in endowment effect research. First, the impact of the endowment effect on student learning should be explored. This study focused on earning extra credit for attending professional development events. While developing professionally is beneficial to the students, how the endowment effect can be used to impact student learning outcomes remains an area suitable for future research. Second, the relationship between gender and the endowment effect needs to be further examined. This study found a significant gender effect but the findings were

inconsistent with some prior research. Future research needs to determine the relationship and causes of observed gender differences in the endowment effect. Lastly, the relationship between the endowment effect and student performance needs further exploration. The causes of the direct relationship between academic performance and response to the endowment effect needs to be determined so that lower performing students might benefit from the use of the endowment effect as much as their higher performing peers.

In conclusion, this study provides further support for the endowment effect's positive influence on individual behaviour. The endowment effect was shown to increase student engagement through participation in professional development activities. According to Morewedge and Giblin (2015), the endowment effect has implications in several fields including psychology, marketing, and economics. Based on the results of this study, the field of education should be added to this list.

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