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Rank as an inherent incentive: Evidence from a field experiment[☆]

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ABSTRACT

Money is the prime incentive considered in economic models. However, recent evidence indicates that people are also greatly concerned about their social rankings. Is this solely because rank brings tangible benefits, or because in addition people have an inherent preference for high rank? This paper deployed a field experiment that provides evidence for an inherent preference. In the experiment, Vietnamese students enrolled in an English course performed significantly better on the official standardized international final test when they were told their rankings on practice tests than when they were not. This result held even when this ranking information could not be reliably communicated, thus severely attenuating the potential to bring tangible or status benefits.

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“... rank among our equals, is, perhaps, the strongest of all our desires.” (Adam Smith, 1759)

1. Introduction

Economists have long noted the merits of competition. When competition reigns, participants usually care more about their rank than their absolute performance, because it is rank that determines the winners and losers. Rank also lies at the core of tournament outcomes, which motivate a broad array of real world phenomena, such as winning a job. People often desire high rank because it brings tangible benefits, such as income, protection, necessities, and conveniences.

In his *Theory of Moral Sentiments*, Adam Smith identified a more fundamental desire for rank:

“Though it is in order to supply the necessities and conveniences of the body, that the advantages of external fortune are originally recommended to us, yet we cannot live long in the world without perceiving that the respect of our equals, our credit and rank in the

society we live in, depend very much upon the degree in which we possess, or are supposed to possess, those advantages. The desire of becoming the proper objects of this respect, of deserving and obtaining this credit and rank among our equals, is, perhaps, the strongest of all our desires, and our anxiety to obtain the advantages of fortune is accordingly much more excited and irritated by this desire, than by that of supplying all the necessities and conveniences of the body, which are always very easily supplied.”

Later economists amplified the view that the desire for rank in wealth or status by itself is a major motivator.¹ Recently, economic modeling has been extended to account for status goods, relative positions, and the rank incentive.² It has been proposed that the rank incentive might have arisen as a direct result of competition and evolution. Individuals strive to outrank their peers on the social scales of wealth and status, since nature's processes promote higher rankings as an avenue to greater reproductive success.³ At the extreme, a significant literature shows that higher payoffs to others can depress one's utility. Veblen's *The Theory of the Leisure Class* (1899) is the best known example.⁴

How does rank influence human behavior? One explanation is that high ranks or relative performance often brings tangible benefits,

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¹ Positional consumption and status have been discussed by Adam Smith (1759), Veblen (1899), Duesenberry (1949), and Fred Hirsch (1976).

² A few examples include Frank (1985), Ng (1987), Congleton (1989), Ireland (1994, 1998, 2001), Pesendorfer (1995), Bagwell and Bernheim (1996), Oxoby (2004), Piccione and Rubinstein (2008), and Rayo and Becker (2007).

³ Notable theoretical works in this area include Eaton and Eswaran (2003), Samuelson (2004), and Rayo and Becker (2007).

⁴ Luttmer (2005) is a rigorous contemporary account.

such as ability signals in the job market (Spence, 1973). High rank or status also gives an advantage in market transactions (Ball et al., 2001). Students and workers can use their grade rankings to impress their friends, admissions committees, and potential employers, and thereby reap tangible gains. Respect and admiration by peers itself can be a tangible benefit. Such tangible and status benefits accompanying rank may be sufficient to explain why rank influences our behavior.

However, Adam Smith (1759) might well have implied that an inherent preference for rank is even more important in motivating people than are the tangible benefits it brings. In other words, humans may be directly and psychologically rewarded by high rank, without the need for any connection to tangible benefits. Charness and Grosskopf (2001) and Charness and Rabin (2002) refer to this as competitive preference. Such competitive preference may be evolutionarily ingrained in our behavior, or environmentally conditioned, like the bell for Pavlov's dogs.

The life sciences indeed suggest such a link. Biological research has shown that high rank is often associated with high concentrations of serotonin, a neurotransmitter in the brain. Even moderate concentrations of serotonin enhance feelings of well-being (Madsen, 1994). One primate study showed that, when a male monkey was experimentally caused to become the dominant monkey in his pack, his serotonin level rose; it then fell when he was demoted (Raleigh et al., 1991). For humans, similar experimental data has not been available, and the relationship of serotonin to rank is not well established. However, a positive correlation between serotonin level and social rank has also been found among male college students in general (Madsen, 1994).

Empirical evidence for the power of ranks has recently emerged from both observational and experimental data.⁵ Using observational data, several studies show that rank information positively affects performance. Blanes i Vidal and Nossol (forthcoming) review personnel records of a firm and find that providing relative performance information leads to a large and long-lasting increase in productivity. This result is quite interesting given that the performance ranks in this context are unlikely to lead to promotion or dismissal. In another study, Mas and Moretti (2009) show that the presence of highly productive workers in a shift pressures other workers to be more productive. In an educational context, Azmat and Iriberrí (2010) exploit a natural experiment in Basque country to show that high school students perform better when they receive a written report giving their grades relative to the class average. Bandiera et al. (2011) capitalize on a natural experiment at a UK university, where some departments gave feedback on period one tests ahead of period two tests, and others did not. These authors find that providing feedback significantly raises student performance, most notably for able students and for those with less initial information. These studies consistently indicate a positive impact of rank information on the behavior of workers.

However, two recent field experiments find a range of intriguing and important effects of rank information on worker's behavior. Barankay (2011a) recruited workers to analyze images at Amazon's online site Mechanical Turk. He finds that many fewer people undertake a task if ranks will be given, and that those given ranks are less likely to return for an unranked repeat task. Ranked workers who do return are less productive than their unranked peers. These effects do not vary across worker characteristics, such as age, prior ranking (including outlier ranking), and self-reported rank preference. The negative effect on productivity does not seem to be driven by complacency, since telling people that they were in the Top 10 did not reduce their performance. In the second field experiment, Barankay (2011b) find that salespeople strictly on commission at a furniture firm are significantly less productive when they are told their rank in the compensation distribution. Interestingly, this effect

⁵ The preference of high ranks is not only an American phenomenon. The incentive of rank has been demonstrated to be a strong motivator in other cultures such as Chinese, Israeli, Swiss, and Spanish. See Lam et al. (2004) and Butler and Kedar (1990).

appears to be due entirely to male workers. Female workers seem less heedful of their ranks than their male counterparts. The first Barankay study arose in the context of casual piece-rate jobs; the second study was conducted on full-time commission-based workers. Both studies report robust and negative effects of rank information on worker performance.

Field studies (particularly field experiments) are powerful because they show how individuals behave in real situations, sometimes under high-stake incentives. The field studies discussed above clearly show that ranks play an important role in motivating people, although in ways sufficiently subtle that the direction of the effect depends on the context. Nevertheless, in the field, some forms of tangible benefits are always associated with ranks. Therefore, existing field studies have not been able to parcel out the inherent preference for rank.

However, several recent studies have been successful in identifying the inherent preference for rank in strictly controlled lab environments. Falk and Ichino (2006) find that the performance of peers induces subjects to perform better even when better performance brings no monetary rewards. Kuhnen and Tymula (2012) show that subjects work harder when told they may learn their ranking privately. Duffy and Kornienko (2010) show that private feedback about rank increases subsequent performance. Charness et al. (2010) distinguish between competitive preference and status, and find evidence supporting both as motivators. Again, not all laboratory studies find the effect of rank information on performance to be positive. Eriksson et al. (2009) find that rank feedback does not improve performance, regardless of the pay scheme used. Hannan et al. (2008) find that feedback on relative performance weakens performance under a tournament incentive scheme, once feedback is sufficiently precise.

Will an inherent preference for rank be found in the field? That is the question this study seeks to answer. Our subjects were students enrolled in a regular one-semester English course for undergraduates at a university in Hanoi, Vietnam. To investigate rank-seeking behavior, we conducted a controlled experiment. The students were randomly divided into three groups: an unranked control group and two treatment groups. The students were tested every two weeks. Students in all three groups received their scores privately after each biweekly progress test. In addition, the two treatment groups were informed of their rankings, one group privately and the other group publicly as well. At the end of the English course, the students took the official TOEIC test.⁶

Both treatment groups outperformed the control group on this test. Divulging rank privately (by phone) gave the students no direct tangible benefits, but nevertheless motivated them to substantially increase their performance. On average they scored at the 59.5 percentile of all TOEIC-takers around the world, compared to 49.5 for the control group. This impressive improvement strongly supports the hypothesis that rank motivates people even when it brings no tangible benefits. In other words, there is an inherent preference for comparative achievement. "Receive rank privately" proved significant in all five of our specifications.⁷

Students who also receive rank publicly outperformed those who only receive rank privately. The coefficients in our empirical specifications suggest that their gains over the control were roughly 45% greater than the gains of those who receive rank privately, an economically meaningful amount.⁸ Presumably due to the modest sample size, this effect only

⁶ The Test of English for International Communication (TOEIC) is administered by the Educational Testing Service, USA (ETS).

⁷ In specification (5), receive rank privately is tested jointly with the interaction term containing that variable. See the footnote in Table 1.

⁸ Moreover, this magnitude and the coefficients were consistent over specifications (1)–(4). The coefficient on "Also receive rank publicly" in specification (5) cannot be compared directly, since (5) interacts "Also receive rank publicly" with the first TOEIC score. Given (5), an individual who received the median score of our group on the first TOEIC, which was 523, who also received rank publicly, would score 22.6 points above individuals who merely received rank privately. Their gain would be 44.8% greater than the gain achieved by those merely getting private ranks. These results are extremely close to those for specifications (1)–(4). (The mean first TOEIC was 524, also leading to very similar results.)

reaches even marginal significance in one of five specifications. It is plausible that public revelation would have a greater incentive effect, since improved performance would be conclusively documented, rather than merely claimed. Mere claims from those privately informed are subject to possible discounting by the listener. Moreover, if one's superior performance is posted, one could avoid any charge of being boastful by revealing one's performance. In this East Asian culture context, behaving modestly is the norm and touting one's success is negatively sanctioned.

One key feature in the design of this experiment was that subjects knew one another socially, much as we know our neighbors or colleagues. This design simulates real life. In Vietnam, students in a class generally know each other relatively well, and openly publicized grades are the standard way of informing students of their scores. This choice of venue allowed us to publicize the ranked scores of the subjects in the publicly informed treatment group.

2. Experiment design

This experiment was designed to test whether people are motivated by the rank incentive, even when their rankings cannot be convincingly communicated to others. The contrasting conditions were no rankings, and publicly posted rankings. In prior field studies, subjects generally could reliably communicate their ranks and thereby potentially gain tangible benefits. In some cases, information about ranks was conveyed privately, but subjects still could communicate this information convincingly to others because they received it in writing. Our experiment was designed to prevent verifiable communication.

Students enrolled in a regular English course at Hanoi's Foreign Trade University were invited to participate in an English-testing experiment in which they would receive free English tests every two weeks during the course, plus study materials and coaching classes. Participating students were informed that they would be notified of their in-course test scores privately by phone. Informing them by phone made it impossible for these students to document any scores or ranks conveyed to others. Cheap talk claims could be made, and might be more believable than otherwise because it was known that rank information had been delivered. However, any tangible benefits from performance on these in-course tests would be slight, since potential employers and overseas universities – the prime intended recipients – would be interested in students' scores on the standardized international official TOEIC test of English proficiency, to be taken once the course was completed.

The experiment was conducted simultaneously in four classes, each with from 27 to 34 students each. Within each class, students were randomly divided into 3 groups: Group 1, BASE, would serve as the control group and would not be ranked; Group 2, PRIVATE, would be notified only privately by phone of their own rankings and told that these rankings would never be available in writing; and Group 3, PUBLIC, would be notified privately by phone of their rankings, as well as publicly, by postings on the university's noticeboard and website. These postings would include only rankings and not the scores. For groups 2 and 3, the rankings would be rankings among all 124 participating students.

	Inform scores		Inform rankings	
	Privately	Publicly	Privately	Publicly
Group 1, BASE	✓			
Group 2, PRIVATE	✓		✓	
Group 3, PUBLIC	✓		✓	✓

At the beginning of the course, the participants took a baseline TOEIC-formatted test at an ETS-authorized testing center. During the semester-long course, they took eight biweekly tests. The rankings in the biweekly tests would be revealed in the ways described above. At the end of the course, participating students took an official TOEIC at a

subsidized fee.⁹ Students who took this final test would receive official TOEIC certificates, which also indicated their test score. This could be helpful to them in finding jobs after their graduation the following year, with higher scores being greater assets.

Given the different incentives acting on the three groups, our interpretation of the final TOEIC scores would be as follows. If Group PRIVATE outperformed Group BASE, it would indicate that the students had a preference for high rank even when they knew their rank could not be verified if communicated to others. This would suggest an inherent preference for high rank. If Group PUBLIC outperformed Group PRIVATE, it would indicate that the students who knew that their rankings would be publicized would have an enhanced preference for rank.

The design of the experiment paid special attention to two issues. First, we did not want the students who receive their ranks privately to communicate or use their rank information to achieve tangible benefits. They were informed of their ranks only by phone and by a research assistant, who neither knew the students nor could provide them with any benefit. We also made clear to the students that they would not receive any written information about their rank during or after the experiment. We cannot rule out the possibility that the students tried to communicate about their performance to their friends, teachers or other people. However, the inability to verify this information would undermine its reliability, even though their relationship to fellow students would put reasonable limits on levels of exaggeration. A major disadvantage to stating one's performance, even if any statement were surely believed, is that doing so could make a student appear boastful, and therefore could attenuate or swamp the tangible benefits that the student might get from doing it.¹⁰

Second, we did not want the students to benefit from the rank information as a feedback about their ability or readiness for the job market. If the students care about the feedback on their ability or readiness for the job market, they should care about their absolute score (on the TOEIC) and not about their relative ranks in a small group at their school, which comprises about 1% of the business majors coming on the job market in Hanoi in a year. The absolute score on the TOEIC can directly translate to their ranks in the broad job market, and thus help to determine what kind of jobs they can get. Therefore, we always provided the absolute score for all the students in this experiment.

In Vietnamese society today, English fluency is a rewarded skill, as it provides access to high-paying jobs and overseas educations.¹¹ This is especially true for students at the Foreign Trade University. TOEIC is a popular test designed specifically to measure English communication skills. It is commonly used by businesses to evaluate the English language skills of job candidates. These students were already spending considerable time preparing for and taking this valuable test. We sought to determine whether a rank incentive would bolster their motivation.

Given the marketable value of English skills and the demonstrated commitment of the students, as expected, the experiment's participation and completion rates were extremely high. All 125 undergraduate students who enrolled in the English course volunteered to participate in the experiment, a remarkable 100% participation rate. These students had taken other courses together for the past three years and knew each

⁹ We did not make the final TOEIC test free to the students because we wanted them to pay for some of the cost and take it seriously.

¹⁰ Our casual conversations with the students in the Group PRIVATE, indicated that they mostly did not share the information about their ranks or scores with other students.

¹¹ Vietnam's economy for the past 20 years has integrated quickly with the world's. According to the *General Statistics Office of Vietnam (2011)*, in 2005 the ratios of foreign direct investment, exports, and imports over GDP were 48%, 62%, and 70%, respectively. This integration has been creating many jobs that require English skills and quite a few that also require an overseas education.

other relatively well. Most of them were 21 years old. There were 98 female and 27 male participants, reflecting the predominance of female students at the university. The students were allowed to skip some of the eight biweekly tests. Only one student dropped out of the experiment, for a personal reason. All the remaining 124 students chose to take the official TOEIC at the end of the course.

3. Results

This experiment showed that the rank incentive exerted a large positive effect, whether rankings on practice tests were known privately or made public as well. On the initial test to establish a baseline, there were no significant differences among the three randomized groups. Four months later, on the final TOEIC test, the average scores of Groups BASE, PRIVATE, and PUBLIC were 604, 656, and 680 points, respectively (Fig. 1). The group that learned of their rankings privately – Group PRIVATE – earned 52 points more than Group BASE. The group whose rankings were also known to others – Group PUBLIC – earned 76 points more than the control group—Group BASE. These differences were statistically and practically significant. Expressed in different terms, starting from an equivalent base, the improvement gains were 81 points for Group BASE, 133 for Group PRIVATE, and 155 for Group PUBLIC, thus 64% greater than Group BASE for Group PRIVATE, and 91% greater than Group BASE for Group PUBLIC.

Group PUBLIC outperformed Group PRIVATE by 24 points, the expected direction. However, this relatively large difference was only marginally significant given our sample size. This difference in performance, if substantiated in a larger sample, would indicate that students working under the public rank conditions received additional motivation from tangible benefits, such as reputation, or an ability to convey their capability or effort without having to make claims that could be doubted or appear egotistical.

The improvement in TOEIC scores of the privately ranked group over the control group within four months is very substantial. Compared to scores of all TOEIC-takers around the world from 2005 to 2007, the Group BASE students scored at the 49.5 percentile. By contrast, students receiving private notice of their rankings scored at the 59.5 percentile, and those receiving publicized rankings scored at the 64.0 percentile.

The experiment had two treatments. The first was to receive rank privately. The second was to be informed privately, but also to have rank publicized. Thus, Group 2, PRIVATE received the first treatment while Group 3, PUBLIC received both.

We ran a regression of the final TOEIC scores on the two treatments (Table 1). Standard errors were clustered at both class and group levels. In regression specifications (1)–(4), the rank incentive significantly

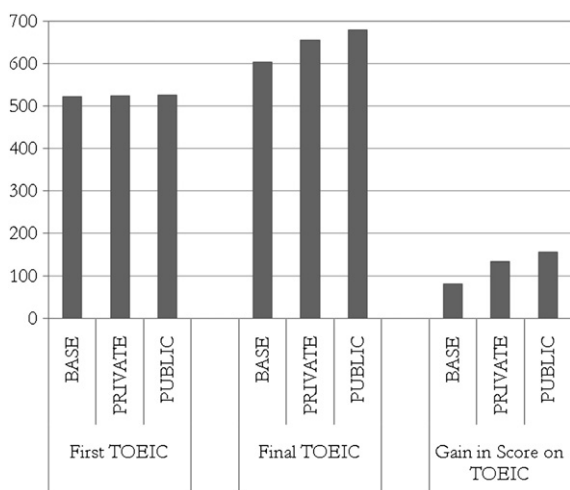


Fig. 1. Group average scores in the first and final tests.

Table 1
The effect of notification of rankings on test scores.

	Dependent variable is score on the final TOEIC				
	(1)	(2)	(3)	(4)	(5)
Receive rank privately (Groups 2 & 3)	52.36* (24.95)	51.55** (19.07)	49.88** (18.92)	50.07** (17.97)	-66.22 ^a (70.18)
Also receive rank publicly (Group 3)	23.83 (28.38)	22.20 (20.79)	22.60 (20.75)	22.27 [†] (13.82)	145.0 (102.6)
First TOEIC score		1.04*** (0.0820)	1.03*** (0.0784)	1.03*** (0.0826)	0.977*** (0.0780)
First TOEIC*Receive rank privately					0.223* (0.103)
First TOEIC*Also receive rank publicly					-0.234 (0.187)
Male			-25.68 (29.54)	-26.73 (29.20)	-23.53 (31.65)
Class 1				31.60 (19.88)	31.70 (20.48)
Class 2				20.77 (20.84)	18.75 (20.56)
Class 3				19.14 (20.49)	18.51 (21.02)
Constant	604.1*** (11.59)	61.50 (45.92)	73.72 (46.19)	54.41 (55.33)	82.27 (58.12)
Observations	124	124	124	124	124
R-squared	0.040	0.648	0.653	0.658	0.664

Note: This table reports the effects of the two treatments on the students' score in the final TOEIC test. The two treatments are to let the students know their ranks and to publicize their ranks. Note that Group 2 PRIVATE receives the first treatment and Group 3 PUBLIC receives both treatments. Score in the first test is the score in the baseline experiment before the experiment started. Group 1, which is the control group, is omitted. Class # indicates to which of four classes the student belongs. Class 4 was omitted. Score in the first test is the score in the baseline experiment before the experiment started. The number of stars indicates the level of significance of two-tailed tests: * significant at 90% confidence level, ** significant at 95% confidence level, *** significant at 99% confidence level, [†] significant at 90% confidence level in a one-tailed test. Robust standard errors are clustered at the class-group level and reported in parentheses for all specifications.

^a The F statistic for the test of the joint significance of "Receive rank privately" and "First TOEIC*Receive rank privately" is 55.5, which is significant at the 99% confidence level. The equivalent test found "Also receive rank publicly" and "First TOEIC*Also receive rank publicly" to be far from significant.

bolstered test scores. In these specifications, we sequentially controlled for initial scores, gender, and classroom effects. As expected, final test scores strongly correlated with initial test scores. A one-point increase in the initial test score of a student was associated with an approximately one-point increase in the final test score of that student. Gender effects were insignificant, not surprising given the paucity of male participants in the sample.

An interesting additional question is whether the rank information affects high- or low-performing students differentially. To answer this question, we added interactions of the treatments with initial English proficiency.¹² Results are reported in column (5) of Table 1. Group PRIVATE and its interaction term are jointly highly significant, as reported in the footnote in Table 1. Group PUBLIC, together with its interaction term is far from significant.

Informing ranks privately motivated students with higher initial scores more strongly, as showed by a positive and marginally significant coefficient for the interaction between privately informing treatment and the initial scores. By contrast, the interaction term for "Also receive rank publicly" is negative (though not significant). These results, if documented in a larger sample, are consistent with the notion that high-performing students may have an inherent preference to rank high, while low-performing students tend to worry about losing face in public.

To see whether the rank incentive motivates greater study efforts or better test-taking effectiveness, we asked the students midway through

¹² We thank a referee for suggesting this study.

the course how much time they had spent studying English per week in the course thus far. In results not shown, Group PRIVATE worked 6 h per week, 1.3 more hours than Group BASE, controlling for the variables in specification (4), Table 1, a highly significant result.¹³ It appears that the rank incentive motivated ranked students to work longer (reported) hours.

There might be several concerns about the interpretation of the results. First, information about their rankings might have helped Group PRIVATE's subjects to optimize their efforts and perform better. This would have been true, for example, if these students had been competing for some tangible benefits that came only to those with very high rankings. However, in our context, the benefits from English proficiency would help students across the performance spectrum to find a better job after graduation. The job market was very large, and these students accounted for only a minute fraction of the job seekers' pool. The subjects are not representative of the labor market since this is relatively an elite university. Further, these students had sufficient information to optimize their efforts, because both control and treatment groups could compare their bi-weekly scores with the TOEIC standards. Also, the teachers in this course did not provide recommendations. Therefore, absolute performance, not relative performance, was what mattered in this context.

Second, all subjects in these two experiments observed the differential treatments across groups, and this observation might have influenced behavior. For example, Group PUBLIC's subjects might have felt that they were being treated unfairly and therefore reduced their efforts. They might also have been less likely to help those classmates who were competing with them for public recognition. Group BASE's subjects in the control group might have imitated the high efforts of the treatment groups. While we do not rule out these effects, we believe that they do not obviate our results for two reasons. First, these effects would have tended to reduce the main effect, but we have found a very large main effect. Second, such behaviors would also have sprung from the rank incentive. These students would have exhibited such behaviors only if they cared about their rankings. Otherwise, they would merely have focused on learning English as best they could.

Finally, the students might be able to vaguely estimate the ranks of the students in Group PRIVATE through their communication or even participation in the class. This might induce this group to work harder to achieve status among its peers. Although this argument might apply to some extent, it would apply to all three groups. Similarly, the final test is an institutional test with formal, written scores, which students could always show to each other, to employers, and overseas schools. At that point, students in the PRIVATE group would reap equal tangible benefits with those in the BASE group from their score. In short, these factors cannot explain the significant performance gains from ranking.¹⁴

Together, these analyses confirm the key finding in this experiment: there is clear evidence that people try to achieve high rank even when their ranking will not be known to others.

¹³ Interestingly, class 1 and class 2 studied significantly more hours, possibly due to their teachers. Group PUBLIC studied somewhat less but did better on the final TOEIC. Neither result was close to significant. We also inquired about work the prior week, thinking that this might lead to more accurate estimates. Though Group BASE worked less than PRIVATE and PUBLIC, there were no significant differences among the three groups, and PRIVATE and PUBLIC were tied. Why might PUBLIC students not have studied more? Conceivably they knew they already had a reputation for performance, and underestimated their hours as a way to indicate to themselves that they were not working so hard just to secure public recognition. They may also have increased their work later in the course to make sure their final TOEIC lived up to their reputations, possibly explaining (if necessary) their insignificantly superior final TOEIC scores.

¹⁴ A further limitation is that implementation logistics made it impossible to ensure that all students took all the interim biweekly tests. Since the sample taking biweekly tests was selective, results from them cannot be meaningfully analyzed.

4. Conclusions

Recently, economists have returned attention to the rank incentive. This paper contributes empirical evidence to the understanding of this important incentive. Our subjects were students enrolled in a course to improve their absolute levels of English skills, which would help them to find a good job in a large job market. They should have cared little about their rankings in their small classes. However, the results show that information about class ranks significantly enhanced the students' efforts and results in the final TOEIC test, even when class rankings brought no direct tangible benefits. This finding is consistent with the notion of the inherent desire for rank that Adam Smith identified in his *Theory of Moral Sentiments*.

There is a legitimate concern whether these results would be found in other cultures or subcultures.¹⁵ These three experiments were conducted in Vietnam, an Asian country where tradition emphasizes the avoidance of "losing face" in public, and where educational attainment is strongly valued. Reinforcing the relevance of these findings in this context, publicized grades are the standard way of announcing students' grades in Vietnam. Thus, participants in these experiments had other ways to signal their abilities to the same group of peers. If these experiments had been conducted in another place, one where publicizing grades was unusual, the observed effect of rank incentive might well have been even stronger. The literature shows that the rank incentive plays a significant role in many cultures.

Socially speaking, the field experiment in this paper shows that the rank incentive can improve the performance of all: individuals work harder, gain more knowledge, and collectively perform better. The rank incentive helps justify the popular use of tournaments to create magnified incentives based on relative performance. However, whether an enhanced-effort outcome is net beneficial depends on the cost of the work, and the net utility gained or lost by making rankings known. We often applaud competition because it promotes efficiency and enables the market system to work efficiently.¹⁶ Rank incentives may be net beneficial in some circumstances, as they encourage all to perform better, but if they lead to a rat race they may be net negative. But whatever the net tally, the record is clear. Humans care considerably about their rank, and any economic analysis that seeks descriptive relevance must attend to the inherent incentive of rank.¹⁷

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¹⁵ For example, high academic performance might be viewed as 'acting white' or betrayal of one's own culture among some minority communities in the U.S. See Fordham and Ogbu (1986).

¹⁶ A salient exception is rent-seeking, where competition can increase inefficiency. For a survey, see Congleton, Hillman, and Konrad (2008).

¹⁷ Schelling (1978) points out that when everyone stands up to see better at a critical moment during a football match, no one sees any better.

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