Competition and Fairness in Proximity to a Standard

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Abstract

The study examines how individuals make decisions in a competitive environment when they may forego financial gains in favor of fairness. Previous research establishes that individuals behave more competitively when they perceive themselves to be close to a reference standard. In addition, a separate line of research establishes that fairness considerations often constrain competitive behavior. This paper seeks to understand how these considerations interact. Consequently, we construct four versions of a survey instrument (i.e., a 2 x 2 design). The instrument manipulates fairness by changing the adverse impact the competitive behavior has on other members of the group. The instrument manipulates proximity to a standard by changing the subject's rank in the competitive scenario. In one version, respondents are told they are the top ranked individual while in the other they are told their rank is simply "average." We find that respondents are significantly influenced by their proximity to a standard, especially the male respondents. Additionally, the relative impact on others did not significantly change the decision choices of respondents.

Introduction

In a modern capitalist economy, decision making is almost exclusively made in a competitive environment. This not only includes business decisions between competing companies, but choices made by individuals in everyday life. To comprehend the decision making process, we must understand the nature of competition itself.

Recent events in financial markets, as well as empirical studies completed by behavioral economists should make us reconsider the fundamental question: what is competition (Stucke 2009)? The traditional definition relies upon the assumption of rational behavior, meaning that firms and individuals will act rationally and with perfect willpower (Stucke 2009). This implies that individuals will optimize their utility by engaging in profit-maximizing behavior. Given these assumptions, competition in traditional neo-classical models is determined only by considerations of market structure. However, attempts to account for the nature and degree of competitive behavior- a behavioral theory of competition- are not new.

As long ago as 1890, Alfred Marshall argued for a behavioral conception of competition. In a well-known section of his Principles of Economics, Marshall argued that:

> Many find in business work, that seems at first sight unattractive, a distinct pleasure, which is partly direct and partly arises from the gratification which the work affords their instincts for rivalry and power. Just as a race-horse or an athlete strains every nerve to get in advance of his competitors, and delights in the strain; so a manufacturer or a trader is often stimulated much more by the hope of victory over his rivals than by the desire to add something to his fortune. The actions of such motives as these must be studied carefully by economists; and the allowance required to be made for them will in some cases be so great as to alter perceptibly the general character of their reasonings (Marshall 1890).

Following Alfred Marshall, Austrian economist Joseph Schumpeter emphasized the behavioral components of competition. Schumpeter argued that to truly understand the

motivations of the "economic man…we must address the fundamental question of the relation between psychology and economics" (Schumpeter 1934, 90). Accordingly, competitive situations might not motivate players to seek profit but rather motivate them to achieve higher standing:

> There is the will to conquer: the impulse to fight, to prove oneself superior to others, to succeed for the sake, not of the fruits of success, but of success itself. From this aspect, economic action becomes akin to sport- there are financial races, or rather boxing-matches. The financial result is a secondary consideration, symptom of victory, the displaying of which very often is more important as a motive of large expenditure than the wish for consumers' goods themselves (Schumpeter 1934, 93).

More recently, a variety of experiments and surveys suggests that factors other than market structure may determine the level of competition. The recent work by psychologist Stephen Garcia suggests that decision making is heavily influenced by the immediate competitive environment (Garcia 2006). Garcia conducts an experiment in which participants are given a choice between a high payoff which gives an even higher payoff to their competitor and a low payoff that gives an equal payoff to their competitor. This experiment would test if the motivation for victory will actually cause decision makers to forego profit maximization as described by Schumpeter. When presented with such a choice, participants will indeed frequently choose the lower payoff. For example, if a decision maker is presented options between a payoff scheme which yields $7 for themselves and $25 for another party by cooperating or $5 for each party by working separately, they will often choose to act "irrationally" and select the $5 gain.

Garcia has identified two key factors that drive this apparently irrational decision making outcome. The first is that decision makers will often choose to exhibit less effort as the

number of competitors increases even if the rewards are proportional to the number of competitors. For example, individuals taking an quiz will perform better and try harder if there are only ten other taking it with them when compared to individuals taking an identical quiz in a room of 100 test takers. This holds true even if the top 20% are rewarded in both scenario, making the chances of winning identical.

The second key factor that affects decision makers is their proximity to a standard. A standard is a prestige ranking, such as placing in the top 10% or being one of the 500 largest American businesses and therefore making the Fortune 500 (Garcia 2007). When decision makers must choose between profit-maximizing collusive behavior more favorable to the other party and more equal but less rewarding option by acting by themselves, decision makers increasingly decide against profit-maximization when they are in close proximity to the standard. This appears to directly challenge the statement that competition causes profit maximization in free markets.

However, other researchers argue that considerations of fairness constrain competition. Kahneman et al. (1986) found that the decision making process includes whether or not the individual feels a particular result is fair. The fairness of a decision is based upon reference points of previous allocation of resources. For example, a store owner deciding to pay its employees $10 per hour will be considered fair if the employees were making $10 or less in the previous year. However, it will be considered unfair if the employees were making $11 last year even if the $10 per hour is above the market equilibrium wage rate.

The purpose of this study is not to prove that free markets do not work, but rather to aid the development of a behavioral theory of competition. More precisely we seek to

understand the nature of environmental cues that increase or diminish competitive behavior. Garcia's work suggests that an individual's proximity to a standard is one important determinant of competitive behavior. But other research suggests that factors such as fairness and gender also play a role. To that end, we survey participants to discern the relative impact of proximity to a standard and fairness considerations in a hypothetical competitive decision scenario. Following the small but significant literature that finds men are more inclined to compete than women (Gneezy et al. 2003, 2004; Vandegrift and Yavas, 2009), we also test whether competitive behavior varies across genders.

To capture the effect of fairness considerations and proximity to a standard, we construct a survey that varies these elements in a 2 x 2 design. We find that respondents are significantly influenced by their proximity to a standard. That is, proximity to a standard produces significantly more competitive behavior - especially among the male respondents. Additionally, the relative impact on others did not significantly change the decision choices of respondents.

Literature Review

Investigation of new variables which affect competitive decision making is a relatively recent phenomenon. Kahneman et al. (1986) was one of the first to demonstrate that a concept of "fairness" could often lead individuals to restrain their competitive behavior. For instance, Kahneman found individuals felt it was fair for firms to raise prices or cut the wages of employees when the firm's profits decrease, but unfair to lower wages when market wages decreased. Furthermore, individuals found it unfair for firms to increase prices when demand

for that good increased under certain conditions. For example, individuals believed it was wrong for a hardware store to increase the price of snow shovels during a blizzard.

To help understand these restraints on competitive behavior, Kahneman identified three key factors that determine judgments of fairness; the reference transaction, the outcomes to the firm and the transactors, and the occasion for action. A reference transaction is a previous price level, wage level, or profit level. Outcomes to the firm and the transactors are defined as gains or losses from these reference points. For example, individuals find it "fair" for a firm to cut wages or increase prices to maintain the reference profit level, but unfair to cut wages or increase prices to increase profits. Likewise, workers are entitled to their nominal wage regardless of fluctuations in the labor market. Kahnman also found that the reference transaction was a nominal reference point: one study found that 62% of respondents thought it was unfair to reduce nominal wages by 7% in a period with zero inflation, while only 22% of respondents found it unfair to only increase wages by 5% in a period of 12% inflation. These two scenarios are actually identical in terms of real wage.

Finally, Kahnman et al. determined that the occasion for an action helped determine its "fairness" to both parties. For example, 79% of respondents found it fair to keep prices constant if wholesale costs to the firm decreased. Yet 75% of respondents stated it was fair for a firm to increase the price of goods by the entire amount of a wholesale price increase. In the first case, the firm reaps the entire benefit of the lower costs. In the second case, the firm transfers all the losses from higher costs to the consumers.

In contrast to Kahneman et al (1986), a series of papers by Garcia and Tor (2006, 2009, 2010) investigate factors that facilitate rather than restrain competitive behavior. Garcia et al

(2006) tests whether proximity to a standard increases competitive behavior. A standard is a prestige ranking with no direct monetary benefit that affects the choice between collusive and competitive behavior. To test whether proximity to a standard increases competitive behavior, the study used eight surveys with undergraduates at several midwestern universities as subjects. The surveys manipulated the proximity to a standard in the context of the following question:

> "Imagine that you are the CEO of a nonprofit organization ranked #1 [#101] in donation earnings. You are thinking about a fundraising joint venture with another nonprofit organization that is ranked #2 [#102]. Income from donations will depend on whether or not you enter the joint venture.
>
> Strategy A: Without a joint venture, your nonprofit organization's donations will increase by 5% and the other nonprofit's donations will increase by 5%
>
> —OR—Strategy B: With a joint venture, your nonprofit organization's donations will increase by 7% and the other nonprofit's donations will increase by 25%."

Results confirmed Garcia's hypothesis that subjects in the high ranking condition selected the competitive option of equal 5% profits at a higher rate than the lower ranking condition. They concluded that this was because of the closer proximity to a standard, as an increase in ranking has more meaning to decision makers at the very top than it does when the decision maker a lower rank

Of course, it is possible that participants don't value the high rank as an end itself but rather because moving from #1 to #2 in the rankings would reduce the non-profit firm's visibility and thus reduce its monetary donations in the future. The second survey was designed to rule out this interpretation. Therefore, the second survey asked the same question as the first, but substituted in rankings #9 and #10 for the high condition and #209 and #210 for

the lower ranking option. Consistent with the hypothesis, individuals of the high condition selected the lesser, equal payouts at a higher rate than the lower condition.

The third study, similar to the first two, studied competitive behavior in close proximity to a standard. The survey offered comparable payout options in all choices but different sets of rankings were used on the test groups. In each condition, the participants were ranked one rank higher than their rival. Participants were once again asked to choose between the high inequitable payoff and a low equitable payoff option described above. In condition one, the participant was assigned a rank of third while their rival was ranked fourth, while participants and rivals in condition two were assigned ranks of 6 and 7. Respondents and rivals in condition three were assigned rankings 12 and 13, and finally condition four respondents and rivals were assigned rankings of 24 and 25.The evidence supported the researchers' hypothesis that when further away from the standard, more individuals acted collusively to maximize their own profit. Only 23% of individuals in condition one reported they would act collusively, while 70% of individuals in test condition four chose to act collusively.

In a follow-up study, Garcia and Tor (2009) test whether individuals would exhibit more effort if their competitors were relatively few in number, and conversely if individuals would provide less effort as the number of competitors increased. Garcia and Tor conducted a field experiment designed to test whether additional factors might cause decision makers to forgo the profit maximizing choice through a condition they referred to as the N-effect. They hypothesized that individuals would exhibit more effort if their competitors were relatively few in number and conversely individuals would provide less effort as the number of competitors increased. Furthermore, this effect would persist even if rewards were proportional to their

rank, such as top 20% would receive an award. Rationally, an individual's effort should remain the same if the top 20% are awarded regardless of whether there are ten competitors or a hundred, as their chances of winning remain the same.

To test their hypothesis, Garcia and Tor randomly assigned undergraduate participants to one of two test groups. Both test groups were given a very short and easy quiz in which the 20% fastest participants to answer all the questions correctly would receive a $5 prize. Test group one was informed that there were ten total participants, while test group two was informed that there were one hundred total participants. The results showed that test group one was significantly average faster and more accurate than their counterparts in test group two. The researchers concluded that by lowering the number of competitors, the proximity to a standard increases, which they termed the N-effect. This also supported that the survey data collected previously did in fact reflect real life behavior.

In a separate paper, Tor and Garcia (2010) hypothesized that individual performance would improve by simply having fewer test takers in the room. Control variables were considered to eliminate other possible explanations for differences in performance. These included differences in the ethnic background, income level, and quality of primary and secondary education. The results showed that individuals at test centers with fewer test takers performed significantly better on both the SAT and Criterion-Referenced Tests.

A second study was conducted to test whether a standard could be set for other rankings besides the "top" standing. A survey of undergraduate students asked them to make a decision for a hypothetical Fortune 500 company. Respondents chose whether to compete or cooperate with the firm ranked immediately below their firm. Half of the respondents were

told they were ranked #103 overall, while the second half were told they ranked #500, just making the Fortune 500 list. The respondents who were told the company was ranked #500 overall selected the competitive option much more frequently than those ranked #103. Garcia and Tor concluded that proximity to a standard can not only be centered around a top ranking, but any prestige ranking such as making the Fortune 500 list itself.

But differences in competitive behavior are not only caused by external factors like proximity to a standard. A series of papers establish that men are more inclined toward competitive behavior than women (Gneezy et al. 2003, 2004). Gneezy et al. (2003) found that although performance between men and women is relatively equal when individuals are paid a fixed amount per task completed (i.e., a piece rate payout), male performance is significantly higher than that of women when men and women compete in tournaments. Gneezy et al. (2004) expanded upon this earlier research and found that boys from ages 9 to 10 showed significantly increased performance when compared to girls of a similar age range. Participants, who were fourth grade students, were asked to run two 40 meter races, both of which were timed. The first was run individually. Participants were then matched independent of gender so that the fastest two times were paired, the next two fastest times were paired, ex cetera so that each pair had similar times for the first race. The second race was then run with each pair starting at the same time. The results showed that boys exhibited significantly more improvement in the second race than girls. This revealed that competitive behavior discrepancies exist between males and females at a young age.

To further explore differences in competitive behavior for males and females, Niederle and Vesterlund (2007) and Vandegrift and Yavas (2009) examine choices when participants

choose between a competitive option (i.e., a tournament) and non-competitive option (ie., a piece rate). Niederle and Vesterlund (2007) requires participants to add a series of two-digit numbers in a five-minute period. Participants complete this task three times and they are rewarded under different compensation schemes: a piece rate, a tournament; and a choice between a tournament and a piece rate.

In Vandegrift and Yavas (2009) participants were randomly assigned to one of two experimental conditions. In each condition, participants were asked to predict fictitious stock prices for a total of 20 rounds. In each round, participants were asked to choose between a piece-rate payout scheme and a tournament payout. For condition one, the tournament was winner take all (WTA). The tournament for condition two used a graduated payout system. The results showed that for tournament entrants male forecasting error was significantly less than that of women. Men also entered the tournament at higher rates. Finally, men were far more likely than women to enter the tournament too frequently and thereby lower their earnings relative to what they would have earned had they been paid in the piece rate for their performance.

Data & Methods

To test whether gender, age, the number of players, and the proximity to a standard will affect the decision making process, a survey has been designed as the primary data source for this research topic. The use of survey data is justified on this subject as the conclusions based upon behavioral surveys performed by Garcia et al. were later confirmed by real world behavior data, indicating that survey data will accurately depict real world behavior so long as the survey is constructed properly.

The pool for the survey will consist of all undergraduate students over the age of 18 at The College of New Jersey, a total applicant pool of approximately 6,460. The population is 66% white, 6.6% African American, 9% Hispanic, and 7.4% Asian, and 0.8% Native American or other with 9.9% not reporting. Additionally, the student population is 57% female, 43% male.

The survey utilizes Qualtrics software and will be emailed to the undergraduate population through a hyperlink. A follow-up email will automatically be sent to all non-respondents two days later. The population will have one week from the second email to complete the survey until the survey is closed. Based upon similar experiments, a response rate of approximately 20% is expected.

This survey will be designed to specifically address two research questions. The first question is what role, if any, fairness plays upon competitive decision making. The instrument manipulates fairness by changing the adverse impact the competitive behavior has on other members of the group. The second question is whether the proximity to a standard will affect competitive decision making. To do this test, respondents in one test group will be told they are the top ranked individual while in the other they are told their rank is simply “average”

Survey Design

To insure maximum response rate, the survey has been designed to be as brief as possible. After agreeing to the informed consent statement, every respondent will be first given a competitive scenario and given a choice between two possible actions. Those who select the second action (Option B) will be given a follow-up question, which will be open response. Finally, all respondents will be asked three demographic options.

To test for fairness and proximity to a standard, four versions of a survey will be randomly assigned when the respondent accesses the survey in order to achieve a 2 x 2 design seen below:

Table 1: 2x2 Construct Research Design

	Low rank	High rank
High impact on others	Version 1	Version 2
Low impact on others	Version 3	Version 4

All four versions will receive a structurally similar question involving a hypothetical competitive scenario. The research question of how fairness affects decision making will be addressed by the high impact / low impact variable. Respondents who receive the high impact scenario in versions 1 and 2 will be told they have five coworkers and $15,000 to divide amongst their coworkers, while the low impact scenario in versions 3 and 4 will be told they have 40 coworkers and $100,000 to divide. The research question of how the proximity to a standard affects decision making will be addressed by the high/low rank variable. Respondents who receive the low rank scenario in versions 1 and 3 will be told that they are the "roughly in the middle of the earnings distribution," while the high rank scenario in versions 2 and 4 will be told they will be the "top earner" amongst their coworkers. Below is question #1 which each

respondent will be receiving, with the impact variations in brackets and bold text and the rank variations in brackets and italics.

Suppose you are working a full-time office job (Monday to Friday, 9am to 5pm). Your employer has allocated **$15,000 [$100,000]** to be awarded on top of base salary to you and **5 [40]** co-workers with whom you share similar responsibilities. Suppose also, that you have just been offered a choice between the following alternatives.

> Option A: Continue with your current work load and split the **$15,000 [$100,000]** evenly among you and your co-workers **(**$2,500 each).
>
> Option B: You must work an additional five hours every week for the upcoming year. However, you will receive $14,000 of the **$15,000 [$100,000]** and your co-workers will split the remaining **$1,000 [$86,000]** (and receive **$200 [$2,205]** each). If you select this option, *you will remain roughly in the middle of the earnings distribution [you will be the top earner]* among your co-workers.
>
> Which of the two options would you choose?
> Option A
> Option B

The respondents who select option B will be given an open response follow-up question across all versions. The follow-up question #2 will appear only to those who have already answered option B above to avoid its presence creating bias for the previous response. Its purpose is to determine if the test variables will change the effort levels respondents would be willing to perform. Unlike the rest of the survey which forces response, this follow-up question permits the participant to make no response. Below is the follow-up question #2 with the high impact and high rank variations in brackets and bold text.

> 2. Given that you selected option B, yielding you $14,000 in additional income for five extra hours of work and making you an *average [the top]* earner among your **5 [40]**

coworkers, please indicate the maximum number of additional hours you would be willing to do. (must be 5 hours or more)

Finally, Questions 3, 4, and 5 were three demographic questions are asked to all respondents. These ask for the participant's gender, class level, and age respectively.

Hypotheses

Hypothesis 1: Comparing version 1 and version 3, a higher percentage of respondents will select option B for version 3. Additionally, those who selected option B will indicate a higher number of additional hours for version 3. This will occur because concerns about the income of others will be more important in version 1 due to the larger amount being taken from each coworker for option B.

Hypothesis 2: For the same reasons stated in hypothesis 1, when comparing version 2 and version 4, a higher percentage of respondents will select option B for version 4, and those who select option B will have a higher number of additional hours in version 4 than version 2.

Hypothesis 3: Comparing versions 3 and 4, a higher percentage of respondents will select option B for version 4. This will occur because the psychological payoff of high rank comes at relatively little cost to the co-workers. Thus, inequity concerns are diminished. Additionally, those who select option B will have a higher number of additional hours in version 4 than version 3.

Hypothesis 4: Comparing versions 1 and 2, a higher percentage of respondents will select option B for version 2. This will occur because the respondent will read this situation as "I was underpaid, I will be working more hours, and after the raise I will be merely at par with the rest. "Most respondents will respond yes to version 2. In version 1, the respondent will be more hesitant to say yes if he/she is concerned with equality of pay. Additionally, those who select option B will have a higher number of additional hours in version 2 than version 1.

Hypothesis 5: Men will have display fewer concerns for inequality than women. Therefore, it is expected that men will select option B with higher frequencies than women in versions 1 and 2.

Hypothesis 6: Men are more likely to respond to close proximity to a standard than women. Therefore, it is expected that men will select option B with higher frequencies than women in versions 2 and 4.

Results

The survey received 1911 responses corresponding to a 29.55% response rate. Two surveys were thrown out due to extreme values in the open responses, as these two indicated they would work over 1,000 additional hours per week. The number of respondents for versions 1, 2, 3, 4 was 472, 482, 486, and 469 respectively (see Table 1). The assignment of roughly one quarter of individuals to each version was expected as respondents were randomly assigned to a version after agreeing to the informed consent. Overall, 53.59% of respondents chose option B for question #1.

Result 1: *We find a no statistically significant difference in respondent behavior as a result of changes to the impact variable when comparing versions 1 and 3.*

Participants chose option B 48.3% of the time in version 1, but only 52.7% of the time in version 3. A Pearson's Chi-square test showed no significant differences in the proportion of participants that chose option B across versions 1 and 3 (χ^2= 1.82, p = 0.176). A probit analysis reaches the same result. Table 2 reports a probit regression of the AorB variable by version for both genders. Although responses for version 3 were .01094 higher when regressed by version alone and higher by 0.1095 when including the age and gender variables, these numbers were not statistically significant. A regression of follow-up question #2 had negative coefficients for the variable "Hours" of -0.0292 and -0.0357, both of which were also not significant as shown on Table3. We therefore find no evidence that participants account for the impact on others when they make a decision to compete.

Result 2: *We find little evidence of a statistically significant difference in respondent behavior as a result of changes to the impact variable when comparing versions 2 and 4.*

Participants chose option B 55.4% of the time in version 2, but only 57.8% of the time in version 4. A Pearson's Chi-square test showed an insignificant difference in the proportion of participants that chose option B across versions 2 and 4 (χ^2= 0.552, p = 0.46). Thus, we find no support for the hypothesis. A subsequent probit regression of variable "AorB" finds that although version 4 has a coefficient of 0.0616 when Version 2 is used as the baseline, it is not statistically significant (see Table 2). The regression of "Hours" had a positive coefficient for

Version 4 of 0.0609 when regressing on Version 2, although this was not significant at any level (Table 3).

Result 3: *We weak evidence for a difference in respondent behavior as a result of proximity to a standard in Versions 3 and 4*

Participants chose option B 52.7% of the time in version 3 and 57.8% of the time in version 4. A Pearson's Chi-square test of the difference in the proportion of participants that chose option B across versions 2 and 4 just misses the cutoff for statistical significance (χ^2= 2.52, p = 0.11). The probit regression of variable "AorB" reported in Table 2 finds that when using version 3 as a baseline, version 4 has a coefficient of 0.1304, which also just misses the cutoff for statistical significance (p = 0.12). Thus, we find only weak support for the hypothesis. Analysis of the Hours variable regression found no statistical significant results (Table 3). Probit regressions by gender also found no evidence of statistical significance (Table 4 and 5).

Result 4: *We find strong statistical evidence supporting a change in respondent behavior as a result of proximity to a standard between Versions 1 and 2.*

Participants chose option B 48.3% of the time in version 1 and 55.3% of the time in version 2. Pearson's Chi-square test showed a significant difference in the proportion of participants that chose option B across versions 1 and 2 (χ^2= 4.80, p = 0.03). The probit regression of variable "AorB" finds Version 2 to have a coefficient of 0.1781 when regressed with all versions with Version 1 as a baseline, and a coefficient of 0.1780 when regressed with all versions as well as age and gender, both of which are significant at the 5% alpha level. This implies that the psychological payoff of due to close proximity to a standard will motivate

respondents to work more hours indicated by option B. The "Hours" variable did not show statistical significance for Version 2 when using Version 1 as the baseline (Table 3).

Result 5: *We find some evidence supporting that men are less influenced by inequality concerns than women.*

Male participants chose option B 49.0% of the time for version 1 while female participants chose option B 47.9% of the time for version 1. Pearson's Chi-square test found the proportion of participants that chose option B when comparing men and women for version 1 to not be significant ($\chi^2 =$ 0.052, p = 0.82). However, male participants chose option B 65.3% of the time for version 2 while female participants chose option B 50.2% of the time for version 2. Pearson's chi-square test showed a significant difference the in the proportion of participants that chose option B across male and females for version 2 (χ^2= 10.09, p = 0.0015). This implies that the inequality concerns are less affective at motivating male respondents to choose equitable payout options as it is for females.

Result 6: *We find strong evidence for men being more heavily influenced by close proximity to a standard than women.*

As reported in result 5, male participants chose option B 65.3% of the time for version 2 while female participants chose option B 50.2% of the time for version 2. Pearson's chi-square test showed a significant difference the in the proportion of participants that chose option B across male and females for version 2 (χ^2= 10.09, p = 0.0015). In addition, male participants chose option B 62.8% of the time for version 2 while female participants chose option B 55.2%

of the time for version 2. Pearson's chi-square test just misses the cutoff for statistical significance in the proportion of participants that chose option B across male and females for version 2 (χ^2= 2.523, p = 0.11). The probit regression of the variable "AorB" for men yielded a coefficient of 0.1780 at 0.05 significance for Version 2 and a coefficient 0.2486 at 0.01 significance for Version 4 when using Version 1 as the baseline (Table 4). For females, the probit regression of "AorB" found none of Versions numbers to be statistically significant (Table 5). This strongly suggests that men are more likely to respond to the close proximity to a standard than women.

Result 7: *The age of female respondents was significant across all versions, but not significant for male respondents.*

Age was not a significant for male respondents, but age had a negative coefficient of -0.0910 for females and was significant at the 1% alpha level (Table 5). Therefore, for the range of 18 to 22 years old, older women declined to exert the greater effort in order to get paid more across all versions.

Conclusion

The results show that proximity to a standard induces more competitive behavior in men. Competitive behavior in women shows no effect from proximity to a standard. Both high rank standard scenarios were shown to significantly increase the competitive behavior for males, but this effect was not significant for female respondents. This is consistent with Gneezy et al. (2003) which found men show higher performance in tournaments than in compensation schemes that pay based on absolute performance.

Niederle and Vesterlund (2007) Vandegrift and Yavas (2009) show women are more willing to compete in piece rate compensation than competitive tournaments payouts, while men will choose tournament payout schemes at higher rates regardless of individual performance. Both studies allowed participants to choose between a piece rate payout and tournament payoff and actually found men to be overconfident as they entered tournament payoffs too frequently after controlling for skill. Nierderle and Vesterlund best summarize this gender behavioral discrepancy, stating "the result is that women shy away from competition and men embrace it."

As tournament rankings implicitly involve proximity to a prestige standard, it follows that men are positively motivated by concerns of their relative rank and will therefore exhibit greater effort to achieve close proximity to a standard. In contrast, this study failed to find any statistically significant effect due to proximity of a standard upon women. The only variable that had a significant impact on the women's choices to compete was age. As our sample was restricted to college aged students from 18-22, the predictive significance is relatively limited. A recommended subject for future study would be how age affects decisions to compete for females over a much larger range of years.

The impact variable proved to have no significance over all versions including when respondents were separated by gender. We found no evidence that individuals take into account the impact on others in their decision to compete. This contrasts with Kahneman et al. (1986) which shows respondents include fairness into their profit seeking decisions. It is possible that the changes to the impact variable were effectively "crowded out" by other

considerations such as personal compensation and the proximity to a standard given by the research question.

Finally, the attempt to more precisely quantify the competitive response through an open ended follow-up question failed to provide any statistically significant results for either the impact or top rank variables. We suggest several reasons for this result. As this question was only available to those who answered option B for question 1, the number of observations was significantly less for this question. Specifically, compared to 1909 individuals who answered question 1, only 991 respondents were given the opportunity for the follow-up question for all four versions. A greater number of observations would have decreased variability may have produced several statistically significant results.

Another reason for the results was psychological anchoring for an open response question. Anchoring occurs when the results of previous questions or the answer choices themselves influence the response itself. Because all individuals who answered this open response had already agreed to five hours, this anchored their responses to how many additional hours they would be willing to work and still take the raise. Out of the 991 respondents, 43.08% indicated that the maximum number of hours they would work would be the five they had already agreed to. If question #1 had asked the same question but for four hours, we suspect that the open response would be anchored to four hours as opposed to five.

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Table 1. Means and Standard Deviations

	Summary of "AorB" by Version					
Variable	Version	Observations	Means	Std. Dev.	Min	Max
AorB*	Version 1	472	0.4831	0.5002	0	1
AorB	Version 2	482	0.5539	0.4976	0	1
AorB	Version 3	486	0.5266	0.4998	0	1
AorB	Version 4	469	0.5782	0.4944	0	1
Hours	Version 1	221	7.4932	3.4603	5	30
Hours	Version 2	259	7.9609	5.5497	5	48
Hours	Version 3	236	7.4640	5.1360	5	60
Hours	Version 4	275	8.0298	4.8172	5	50
Age (in years)	All	1909	20.0524	1.3112	18	22
Gender**	All	1909	0.6574	0.4747	0	1

*AorB is coded as the binary response to question 1. Option A response is coded as a 0, option B as 1
**Male = 0, Female = 1

Table 1a. Means and Standard Deviations for Male Participants

Variable	Version, Gender	Observations	Means	Std. Dev	Min	Max
AorB	Version 1, Male	157	0.4904	0.5015	0	1
AorB	Version 2, Male	167	0.6527	0.4775	0	1
AorB	Version 3, Male	166	0.5422	0.4997	0	1
AorB	Version 4, Male	164	0.6280	0.4848	0	1
AorB	Version 1, Female	315	0.4794	0.5004	0	1
AorB	Version 2, Female	315	0.5016	0.5008	0	1
AorB	Version 3, Female	303	0.5182	0.5005	0	1
AorB	Version 4, Female	322	0.5528	0.4980	0	1

*AorB is coded as the binary response to question 1. Option A response is coded as a 0, option B as 1
**Male = 0, Female = 1

Table 2. Probit Analyses of Choice to Compete

	AorB on Ver 1	AorB on Ver 2	AorB on Ver 3	AorB on Ver 4	AorB on Ver 1 w/ Gender, Age
constant	-.0425 (.0577)	.1356** (.0572)	.0669 (.0579)	.1973*** (.0572)	1.616*** (.4482)
Version 1	--	-.1781** (.0813)	-.1094 (.0817)	-.2398*** (.0813)	--
Version 2	0.1781** (.0813)	--	.0688 (.0814)	-.0616 (.0810)	0.1780** (.0816)
Version 3	0.1094 (.0813)	-.0688 (.0814)	--	-.1305 (.0814)	0.1095 (.0824)
Version 4	0.2398*** (.0577)	.0616 (.0810)	.1304 (.0814)	--	0.2486*** (.0816)
Gender	--	--	--	--	-0.1743*** (0.0611)
age	--	--	--	--	-0.0770*** (.0220)
Pseudo R2	0.0036	.0036	.0036	.0036	0.0114
n	1909	1909	1909	1909	1909

Standard errors in parentheses. * = 0.1 level of statistical significance, ** = 0.05 level of statistical significance, *** = 0.01 level of statistical significance

Table 3. Regression Results on the Hour Response for Participants who Chose to Compete

	Open on Ver1	Open on Ver2	Open on Ver3	Open on Ver4	Open on Ver1 w/ Gender, Age
constant	7.4932*** (.2327)	7.9609*** (.3448)	7.4640*** (.3342)	8.030 (.2905)	3.6816** (2.1936)
Version 1	--	-.4677 (.4160)	.0292 (.4073)	-.5366 (.3722)	--
Version 2	.4677 (.4160)	--	.4969 (.4802)	-.0689 (.4509)	.4551 (.4194)
Version 3	-.0292 (.4073)	-.4969 (.4802)	--	-.5658 (.4429)	-.0357 (.4060)
Version 4	.5366 (.3722)	.0689 (.4509)	.5658 (.4429)	--	.5497 (.3695)
Gender	--	--	--	--	-.2933 (.3251)
age	--	--	--	--	.2005** (.1116)
R2	0.0029	0.0029	0.0029	0.0029	0.0068
n	991	991	991	991	991

Standard errors in parentheses. * = 0.1 level of statistical significance, ** = 0.05 level of statistical significance, *** = 0.01 level of statistical significance

Table 4. Probit Analyses of Choice to Compete for Males

	AorB on Ver 1	AorB on Ver 2	AorB on Ver 3	AorB on Ver 4	AorB on Ver 1 w/ Age
constant	-.0240 (.1001)	.3926*** (.0998)	.1059 (.0975)	.3267*** (.0998)	.9495 (.7803)
Version 1	--	-.4166*** (.1413)	-.1298** (.1397)	-.3506 ** (.1414)	--
Version 2	.4166*** (.1413)	--	.2867 (.1395)	.0659 (.1412)	.4174*** (.1417)
Version 3	.1298 (.1397)	-.2867** (.1395)	--	-.2208 (.1396)	.1333 (.1401)
Version 4	.3506** (.1414)	-.0659 (.1412)	.2208 (.1396)	--	.3614** (.1417)
age	--	--	--	--	-.0485 (.0385)
Pseudo R2	0.0127	0.0127	0.0127	0.0127	0.0148
n	654	654	654	654	653

Standard errors in parentheses. * = 0.1 level of statistical significance, ** = 0.05 level of statistical significance, *** = 0.01 level of statistical significance

Table 5. Probit Analyses of Choice to Compete for Females

	AorB on Ver 1	AorB on Ver 2	AorB on Ver 3	AorB on Ver 4	AorB on Ver 1 w/ Age
constant	-.0517 (.0706)	.0040 (.0706)	.0455 (.0720)	.1327* (.0700)	1.7689*** (.5439)
Version 1	--	-.0557 (.0999)	-.0973 (.1009)	-.1844* (.0995)	--
Version 2	.0557 (.0999)	--	-.0415 (.1009)	-.1287 (.0995)	.0567 (.1003)
Version 3	.0973 (.1009)	.0415 (.1009)	--	-.0872 (.10052)	.1009 (.1015)
Version 4	.1845* (.0995)	.1287 (.0995)	.0872 (.1005)	--	.1935* (.0997)
age	--	--	--	--	-.0910*** (.0270)
Pseudo R2	0.0021	0.0021	0.0021	0.0021	0.0087
n	1255	1255	1255	1255	1254

Standard errors in parentheses. * = 0.1 level of statistical significance, ** = 0.05 level of statistical significance, *** = 0.01 level of statistical significance