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Myopic Biases in Competitions:
Implications for Strategic Decision Making

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Abstract

Recent research has shown that when people compare one thing to another, they tend to focus myopically on the target of the comparative judgment and do not sufficiently consider the referent to which the target is being compared. This paper applies this recent theoretical progress to the problem of predicting the outcomes of athletic competitions. In three studies, we show that the focal competitor's strengths and weaknesses feature more prominently than do the strengths and weaknesses of the opponents. People are more confident of success when their own side is strong, regardless of how strong the competition is. Implications for theories of strategic decision making in competitive settings are discussed.

Myopic Biases in Competitions: Implications for Strategic Decision Making

One of the most important strategic issues facing any organization is an accurate understanding of the competition (Porter, 1980). The strength or weakness of the competition is a key factor influencing the success or failure of any venture. Managers need to understand their competitors in order to make decisions about entry into new markets and investment in existing markets. Investors and potential investors, including venture capitalists, need to understand the strength of the competition in order to develop accurate forecasts about the future success of a company. This paper examines the psychology of competitor perception and its implications for strategic decisions. Recently, there has been important progress in the psychological literature that can help develop our understanding of how people perceive competitive situations (Moore and Kim, 2003; Windschitl, Kruger, and Simms, 2003). In this paper, we apply these new insights to the problem of understanding the competition and using that understanding to anticipate the outcomes of competitions.

Research in organization theory often makes strong assumptions about managers' ability to understand their competitive environments. Contingency theories generally assume that managers are able to identify and understand the competitive environment, and that it is the task for managers to respond to the environment as best they can (Lawrence and Lorsch, 1967; J. D. Thompson, 1967). Research in strategic management, especially research conducted from an economic perspective, tends to make even stronger assumptions about managerial rationality. In deciding whether to enter a new market or invest in increased capacity, managers and investors are assumed to have assessed their competition accurately (Spence, 1979; Dixit, 1980; Tirole,

1988). In this paper, we examine the psychological processes at work in competitive analysis. We ask whether it is reasonable to assume that managers can conduct such analyses in a rational and unbiased way, and if not, exactly how their judgments are biased and what it means for their decisions.

In 1991, Zajac and Bazerman proposed that bounded human rationality gives rise to “blind spots” in managers’ strategic vision. Their work built on the fundamental principle that managers, as boundedly rational beings, make imperfect decisions (Simon, 1947; Barnes, 1984; Schwenk, 1984). Zajac and Bazerman proposed that strategic decision makers would pay insufficient attention to competitors’ contingent decisions. That is, they would fail to anticipate competitors’ responses to their own decisions to enter a new market or expand in existing markets. The failure to appreciate competitors’ responses will generally make market entry appear more attractive than it turns out to be, resulting in excess entry and excess capacity.

Research has supported important aspects of the arguments put forth by Zajac and Bazerman. Entrepreneurs routinely neglect consideration of the competition, resulting in what appears to be overconfident entry decisions (Camerer and Lovallo, 1999). Cooper, Woo, and Dunkelberg (1988) asked nearly 3000 new business founders about their chances of success and found that 81% of their respondents thought their businesses had more than a 70% chance of succeeding. This occurred despite the fact that evidence suggests that roughly half of all new businesses fail within their first four years (Dunne, Roberts, and Samuelson, 1988; Audretsch, 1991; Mata and Portugal, 1994; Wagner, 1994). Among established businesses, there also is evidence of general excessive entry in the form of overinvestment in productive capacity (Porter, 1980; Thayer, 1985). Other evidence suggests that rates of merger and acquisition may be

driven up by managers' overconfidence that they can do better than current managers of the acquired firms (Roll, 1986; Hayward and Hambrick, 1997; Malmendier and Tate, 2003).

What Zajac and Bazerman did not predict was that the failure to consider competitors extends beyond anticipating their future contingent behaviors. It also appears to include the failure to consider competitors' existing abilities. New developments in the psychological literature have questioned some of the broad conclusions reached by research on overconfidence. Recent evidence suggests that overconfidence is not universal. In fact, on tasks that are difficult or in domains where success is rare, people consistently rate themselves as worse than average even though the task is difficult for everyone (Windschitl, Kruger, and Simms, 2003; Moore, 2004a, 2005). For example, people report that they are below-average unicycle riders (Kruger, 1999) and believe that they are less likely than average to find a \$20 bill on the ground in the next two weeks (Chambers, Windschitl, and Suls, 2003). Participants in the Moore and Kim's (2003) experiments were invited to bet on beating a randomly selected opponent in a trivia contest. Half the participants took a simple trivia quiz and half took a difficult trivia quiz. However, those who had taken the difficult quiz reported believing that they were worse than average and bet significantly less on beating a randomly selected opponent. However, since they were competing against others who had taken the same quiz, participants in the two conditions actually had equivalent probabilities of winning.

These results are consistent with what Camerer and Lovallo (1999) called "reference group neglect," in which people making comparative judgments appear to be overly sensitive to their own absolute performance and neglect to sufficiently account for the relevant reference group (see also Klar and Giladi, 1997; Giladi and Klar, 2002). When applied to the problem of confidence in competitive settings, these prior findings suggest that competitors will attend

myopically to their own capabilities when predicting whether they will be victorious in a competition. When competitors are universally weak, all competitors are likely to be more pessimistic about their chances of winning than they will be when all competitors are strong. In contests composed of weak competitors, we hypothesize that participants will be less optimistic about winning than will competitors in contests where all teams are strong.

The Current Studies

In this paper, we have chosen athletic competition as a context in which to study these perceptions. We have chosen this context for three reasons. First, unlike most other types of contests, athletic competitions provide outcomes that are clear and unambiguous. This is important because it provides unambiguous measures for testing our hypotheses. This clarity also minimizes ambiguity in the minds of our participants about the standards for success and failure. Research shows that motivated biases tend to be strongest when ambiguity creates an opportunity for the formation of idiosyncratic definitions of outcomes or measures (Kunda, 1987). Interpersonal comparisons are most likely to be egocentric when the standards for performance are ambiguous (Dunning, Meyerowitz, and Holzberg, 1989; Hayes and Dunning, 1997). Therefore, we have chosen a domain that offers a conservative test of our hypotheses.

The second reason why we have selected the domain of athletic competition is that it provides substantial amounts of experience for participants. The teams in the studies we present each play numerous games against a variety of opponents. This recursive nature is important because it provides a great deal of clear feedback that tends to improve the accuracy of perceptions of ability (Mabe and West, 1982). In contrast, many other conflicts and competitions are unique instances in the sense that they will never be repeated with exactly the same constellation of players, interests, and issues. By selecting a context that provides

contestants with so much clear feedback, we have again opted for a conservative test of our hypotheses. Given that we have hypothesized the existence of systematic biases in predictions of future performance, experience and clear feedback are more likely to reduce such biases than to exacerbate them.

The third reason we selected the context of athletic competition is its importance. Americans spend trillions of dollars annually to watch sporting events (Noll and Zimbalist, 1997). People care a great deal about the outcomes of sporting contests as fans, and also because a great deal of money is wagered on them. By one estimate, over \$380 billion is wagered annually in legal and illegal betting on athletic competitions (National Gambling Impact Study Commission, 1999). The first two studies we present look directly at predicted outcomes of athletic contests. The third study examines bets on sporting events made in Las Vegas.

Hypotheses

While we expect there to be general agreement that the strongest teams are also likely to win future competitions, we expect that this belief will be stronger among those focusing on the team (such as members of the team, the team's owners, or its fans) than among others. In other words, when a team is strong, we expect people focusing on that team will be inordinately confident that it will win future matches. These predictions will be relatively insensitive to the strength of the competition. When competitors make predictions about their own teams, the team's strengths and weaknesses will feature more prominently in their decisions than when they are making predictions about other teams. As a result, people will be influenced more by team quality when making predictions about their teams than they will be when making predictions for other teams.

STUDY 1: INTRAMURAL SOCCER

Method

Participants. Participants were recruited from a pool of 722 Carnegie Mellon University undergraduate and graduate students who were members of the university's four intramural soccer leagues. There were a total of 78 teams across four leagues: major, intermediate, minor, and women only. Teams were sorted into leagues based on strength, with the best teams placed in the major league, weaker teams in the intermediate, and still weaker teams in the minor league. Teams in the women only league tended to be the weakest of all since better female players routinely played for teams in the other mixed-gender leagues. The larger leagues were further subdivided into divisions of between four and six teams. All members of the four intramural leagues were invited through email and campus fliers to participate in the study by completing an internet questionnaire on upcoming league playoff match-ups. All participants were eligible to win a \$100 cash prize lottery, with the probability of winning directly proportional to the accuracy of predictions on which teams would win the playoff matches. A total of 180 players out of the 722 in the pool completed the web-based questionnaire.

Procedure. On the website, participants were requested to provide their email addresses as well as their team names, divisions, and leagues. Participants were then presented with all possible pairings of teams in their respective divisions and asked to make predictions about the outcomes of possible post-season playoff matches. The greatest number of teams in any single division was six, meaning the highest number of possible pairings was 15. Questions used the following format: "If Team A were to meet Team B, what is the probability that Team A would win?" The order in which teams appeared in the questions was manipulated experimentally so that each team in the pair was listed as the focal team half the time. Each participant was

randomly assigned to one of the two order conditions. For example, participants in the league that included the teams “Masters of Ball Administration” and “Brutal Ruckus” were all asked to predict the outcome if these two teams met in the playoffs. Half the respondents from this division answered the question, “If Masters of Ball Administration were to meet Brutal Ruckus, what is the probability that Masters of Ball Administration would win?” and half the respondents answered the question, “If Brutal Ruckus were to meet Masters of Ball Administration, what is the probability that Brutal Ruckus would win?” The various possible matches appeared in the same random order for each division. All data were collected before the actual playoff matches had been announced.

Results

We computed averages for each participant for each of four estimated probabilities: (1) that their own team would win when it was the target of comparison (Team A); (2) that their own team would win when it was the referent (Team B); (3) that other teams in their divisions would win when they were the targets of comparison; and (4) that other teams would win when they were the referents. These average estimates for each participant were then subject to a 4 (league) $\times 2$ (target: own vs. other teams) $\times 2$ (target vs. referent of comparison) ANOVA with repeated measures on the second and third factors. This analysis was carried out at the level of the individual participant and each participant’s team’s record of wins was included as a covariate.

The results reveal a main within-subjects effect for target, $F(1, 107) = 33.9, p < .001$. Participants estimated that their own teams would be more likely to win ($M = 67\%$, $SD = 24\%$) than would other teams ($M = 52\%$, $SD = 17\%$). The results also reveal a main between-subjects effect for team record of wins, $F(1, 107) = 75.6, p < .001$, reflecting the sensible result that teams with more wins were predicted to win more often. However, these two main effects are

qualified by a significant target \times record interaction, $F(1, 107) = 75.6, p < .001$. This interaction (illustrated in Figure 1) shows that, consistent with our hypotheses, the effect of the focal team's record of wins on predictions of future success was stronger when members of that team were the ones making the prediction than when others were making the prediction. Those team members are more likely to have placed meaning on the record and been cognizant of the underlying factors that constituted the record (greater focus and knowledge respectively).

The results also reveal another main effect for league, $F(3, 107) = 5.33, p = .002$. However, this main effect is qualified by a significant target \times league interaction, $F(3, 107) = 5.3, p = .002$. This interaction (illustrated in Figure 2) shows that, consistent with our hypotheses, the effect of the focal team's league was stronger when members of that team were the ones making the prediction than when others were making the prediction. This means that players in the women's league (lowest competitive level) predicted that their own teams had a 56% chance of winning any given game, while players in the major league (highest competitive level) predicted that their own teams would have an 81% chance of winning any given game.

Discussion

The results of the first study suggest that participants were systematically overconfident regarding their performance. This result replicates previous findings on overconfidence. While it is possible that participants were intentionally attempting to display confidence to increase team morale and competitive intimidation for the upcoming playoff games, this tendency should have been dampened by the fact that all participants knew that their estimates were made anonymously and privately, and also that more accurate estimates would increase their chances of winning the \$100 prize.

Our more interesting result is that our respondents' levels of confidence interacted with their teams' records. Respondents predicted better future performance for their own teams than they did for other teams, but this was only true when their teams were good. When the performances of respondents' teams were bad, the difference between predictions for the respondents' own teams and other teams was eliminated. The tendency to overestimate their own teams' future performance (relative to others' predictions for their own team's future performance) only held for members of good teams with records of prior success. This was true across leagues. The worst teams in the least competitive league showed the least overconfidence, and the best teams in the most competitive league showed the most overconfidence. In addition, there was a complementary effect of league. Players in the more competitive leagues were consistently more optimistic about their teams' probability of winning post-season games than were players in the less competitive leagues.

It seems likely that the respondents in Study 1 knew more about their own teams than they did about other teams. If participants feel ignorant about the quality of other teams, their predictions for the future chances of success of those other teams ought to regress to the ignorance prior estimate of 50%. After all, if one is asked to predict the probability that one unknown team will beat another unknown team, a fairly sensible guess might be 50%. Differences in the quality of people's information about self and others can produce both better-than-average and worse-than-average effects (Moore and Small, 2004). When people have better information about themselves than they do about others, they are likely to believe that they are (1) above average when they are good or when the task is simple (even if everyone is good or the task is simple for everyone) and (2) below average when they are bad or when the task is

difficult (even if everyone is bad or when the task is difficult for everyone) (Kruger, 1999; Moore and Kim, 2003).

The data from Study 1 are imperfect in a number of ways. First, team strength may be confounded with players' commitment, and it is possible that players' motivation leads both to the team's success and to overconfident predictions of future success (Kunda, 1990; Sanitioso, Kunda, and Fong, 1990). It could be that the greater confidence expressed by members of better teams are a result of the fact that teams perform better when their players are committed to their team's success. These committed players are likely to practice more and care more about their teams' success. It makes sense that these people will also then be more motivated to believe that their teams will win. We cannot rule out this alternative explanation with the data from Study 1. A second imperfection in the data is that knowledge of a team is confounded with team affiliation. We cannot know whether the effects we observe are due to players' focusing on their teams or whether they are due to players' greater knowledge of their teams. A third problem with the data in Study 1 is there is a gender confound with respect to the women's only league. Players in this league were the most realistic about their teams' future chances of victory. It is possible that this result is due to women being less prone to overconfidence than men (Pallier et al., 2002; Pallier, 2003) rather than an effect of the strength of the teams in the league.

The second study addresses these shortcomings and attempts to test our hypotheses in a different competitive domain. Unlike in Study 1, participants in the second study made predictions about the performance of teams of which they were not members. Instead, we asked Carnegie Mellon undergraduates to predict the performance of teams in the National Basketball Association (NBA).

STUDY 2: PREDICTING PERFORMANCE OF NBA TEAMS

There is growing evidence that myopic biases in comparative judgments of the sort we have demonstrated in Study 1 are not necessarily egocentric effects. Moore and Kim's (2003) third experiment included a condition in which each participant was betting not on his or her own score, but on the scores of a randomly selected protagonist. Each participant's bet would win if the protagonist's score was higher than that of a randomly selected opponent. The results showed a main effect of difficulty that did not interact with whether participants were betting on themselves or another protagonist. Whether they were betting on themselves or another protagonist, people bet more when the test was simple than when it was difficult. Moore and Kim's fourth experiment showed that this effect was attributable to focusing on the protagonist, and could be eliminated or reversed by manipulating focus. When participants were led to focus on the opponent, the standard effect reversed itself so that people actually bet more on winning a difficult competition than a simple one.

Therefore, we hypothesize that the effect we have demonstrated in the first study is not a purely egocentric effect. People will show the same prediction biases when they merely focus on other teams. In this second study, we asked participants to make predictions about the future performance of professional basketball teams in the NBA. We expected that when people were focusing on a particular team (e.g., because they were fans of that team), the team's strengths and weaknesses will feature more prominently in predictions. As a result, when fans are making predictions, they will be overconfident of their teams' chances of winning in the future when those teams are strong. However, the predictions of less focused observers (e.g., people who do not care whether the team wins or loses) will not show this bias to the same extent. Furthermore,

we expect this effect to persist even after controlling for people's familiarity with the team about which they are making their predictions.

Method

The study was conducted during the break in the regular 2003-2004 NBA professional basketball season around the league's All-Star Weekend. Participants were provided with information about teams' performances during the first half of the season and were asked to use that information as well as their own knowledge to predict each team's performance in the second half of the season.

Participants. A total of 136 students in three different undergraduate business courses at Carnegie Mellon University were asked to complete a questionnaire that asked them to predict the performance of teams in the NBA. As in Study 1, participants were eligible to win a lottery based on the accuracy of their predictions. Here, the lottery winner would win the right to decide which charitable organization would receive a \$100 donation. One hundred six students completed the questionnaire.

Procedure. Participants were directed to a website that presented them with two pages of questions. Half of the participants were randomly assigned to answer each page first in order to rule out idiosyncratic effects of order.

One page of questions involved predicting the winning percentage for each of the NBA's 29 teams during the second half of the season. We provided information on each team to reduce noise in the data by ensuring that all participants had at least a minimum amount of information upon which to draw. This information included two indicators of prior performance: (1) record for the first half of the season and (2) record in the last 10 games played. It also included two facts about each team's second-half schedule: (1) a measure of second half schedule difficulty,

namely the combined record to date of all opponents to be played and (2) the split between home and away games left to play. We expected that first half record, record in last 10 games, and home/away ratio would be positively related to second half performance while record of remaining opponents would be negatively related. These predicted relationships were not divulged to participants.

The other page of questions asked participants about both their knowledge of and rooting interest for each team. Participants rated their knowledge of each team on a 5-point scale, labeled as follows:

- 1 = Very Low (I didn't know there was such a team.)
- 2 = Low (I've heard of it but couldn't tell you anything about it.)
- 3 = Neither High Nor Low (I know the team's star players and/or I have a general idea of how successful the team has been.)
- 4 = High (I know some of the team's players and their abilities and/or I know the strengths and weaknesses of the team as a whole.)
- 5 = Very High (I know most of the team's players and their abilities as well as the strengths and weaknesses of the team relative to other teams in the league.)

Participants also reported the degree to which they favored (were "rooting for") each team, using the following 5-point scale:

- : I strongly dislike this team and I hope that they will lose
- : I somewhat dislike this team
- = : I do not care much whether this team wins or loses
- + : I somewhat favor this team
- + : I strongly favor this team and I hope that they will win

This scale was coded using the range -2 (for "*strongly dislike*") to 2 (for "*strongly favor*").

In order to use this question on rooting interest as a measure of focus on the team, we decomposed it into two variables. We reasoned that people could focus on a team either because they wanted them to win or because they wanted them to lose. In either case, we expected that focal team's record to exert undue influence on predictions of future performance. The variable *FOCUS* was computed by taking the absolute value of each participant's response to the question

on rooting interest. This transformation reflects the observation that the driving force is the strength of the rooting interest and not the direction (either for or against a team). The second variable, *FAN*, was a dummy variable that took a value of 1 if the participant was a fan of that team (by indicating that he or she favored that team's winning), and 0 otherwise.

Results and Discussion

Table 1 shows means, standard deviations, and bivariate correlations between the measures. A few aspects of these results merit mention. First, the correlation between performance in the first half and performance in the second half is strong, $r = .71$. Second, the correlation between people's predictions and teams' actual performances in the second half is weaker, $r = .49$. On average, people could have made better predictions than they did by simply predicting that each team would win games at the same rate in the second half as it did in the first half. Third, teams that perform well do have more fans, but this relationship is modest in the current data set. The correlation between participants' rooting interest and performance in the first half of the season is only $.02$. As Figure 3 would suggest, it would appear that the relationship between a team's winning record and whether people root for the team or not is curvilinear. Teams that win more often are more likely to be loved or hated. This construct is measured by the *FOCUS* variable, which is equal to 0 when participants indicates they are indifferent whether the team wins or loses and increases as they feel stronger about wanting the team to win or lose. The correlation between teams' first-half performances and the *FOCUS* variable is somewhat stronger, $r = .11$.

Our prediction was that the effect of team strength on predictions of future performance would be magnified by participants' focus on that team. Thus, we hypothesized a significant effect of the interaction between *FOCUS* and the team's record in the first half of the season on

participants' predictions of performance in the second half. The bivariate relationship between these two variables is strong, as shown in Table 1, $r = .45$. However, because it is possible that this relationship is accounted for by other variables, the key test for our hypothesis comes in a multivariate regression. The results of this regression equation are presented in Table 2. This table juxtaposes the model in which participants' predictions serve as the dependent variable with the optimal prediction model in which teams' actual second-half records serve as the dependent variable. Terms for individual participants were included in both models but do not appear in the table.

As hypothesized, the *FOCUS*First half record* interaction effect, which appears on the last line of the table, is a significant predictor of participants' forecasts. When fans were focusing on a team, that team's strengths and weaknesses dominated predictions of the team's future success. A number of the control variables also emerge as statistically significant. Participants' reported knowledge of the focal team has a significant and positive effect: The more someone believes they know about a team, the more likely they are to predict its success. Furthermore, rooting interest had a significant "wishful thinking" effect: The more someone is rooting for a team, the more they believe that the team will win. None of these subjective factors were actually useful for predicting teams' actual performance in the second half of the season. As the second model in Table 2 shows, only the four objective pieces of information given to each participant were useful for predicting performance in the second half. Only two of these indicators exerted a significant influence on participants' forecasts.

It should not be surprising that teams' performance in the first half of the season influenced our respondents' predictions about performance in the second half. However, consistent with our hypotheses, when our respondents were focusing on a particular team, the

effect of prior record on predictions of future success was magnified. For instance, there were three teams that completed the first half of the season having won at least 70% of their games: the Indiana Pacers, the Minnesota Timberwolves, and the Sacramento Kings. Among those 67% of our respondents who reported themselves to be indifferent regarding whether these teams won or lost, the average predicted winning percentage in the second half was 65% ($SD = 18\%$). Among the 23% of respondents who reported either mildly liking or disliking these teams, the average predicted winning percentage in the second half was 69% ($SD = 16\%$). Among the 7% of respondents who reported either passionately hating or passionately loving these teams, the average predicted winning percentage in the second half was 73% ($SD = 9\%$). This suggests that when people were focused on a particular team, that team's abilities featured more prominently in their predictions of future performance.

It is also noteworthy that the strength of opponents in the second half of the season is significantly related to actual winning percentage but not to predicted winning percentage. This result highlights an important feature of the bias we document, specifically the fact that focusing on one competitor implies insufficient focus on the other side. Normatively, when predicting the outcomes of competitions, people should make assessments based on both competitors. However, as we show, the opponent is not always taken into consideration as it should be.

STUDY 3: BETTING ON NCAA FOOTBALL GAMES

The first two studies offered incentives (lotteries for cash or charitable donations) based on the accuracy of predictions on future athletic contests. In both cases, participants did not risk any of their personal money, meaning the penalty for biased prediction was relatively low. Study 3 examines a situation where inaccurate predictions can have more substantial

repercussions: the sports betting market. While our theory should extend to betting behavior, sports betting also presents a number of challenges for testing our hypotheses. First, it is difficult to get access to data. Betting on sports is illegal most places, making it harder to find those who have the data and making them reluctant to share it. Additionally, in the legal market found in Nevada, betting is carried out through anonymous spot transactions, making information gathering problematic there as well. Fortunately, the betting lines themselves are available and can provide some information about bettors' beliefs and their subsequent behaviors. The following section describes the betting line in greater detail and explains the properties that make it useful for our analyses.

Mechanics of the Betting Line

In sports gambling, one common type of betting involves the point spread (also referred to as the betting line). A point spread for a game typically takes the following form:

Favorite – X

Underdog

A bettor places money on the favorite when he believes that team will win by a greater number of points than the point spread X (the favorite's margin of victory minus the point spread is greater than 0). A bettor places money on the underdog when he believes that team will lose by less than the point spread (underdog margin of defeat plus the point spread is greater than 0) or win the game (underdog has a positive margin of victory). Winning either of these bets is often referred to as "covering the spread." If the margin of victory for the favorite is equal to the point spread, the game is a "push" and the bet is refunded. For those unfamiliar with sports betting, a more detailed set of examples of betting outcomes can be found in the appendix. For winning bets, a sports book or bookie will generally offer payouts on an "11/10" schedule. That

is, for every \$11 bet, a winning bet will return a profit of \$10. The \$1 difference is referred to as the “vigourish.” This ratio favors the bet taker so that bettors must win 52.4% of their bets (in dollars) to break even.

The vigourish provides a guaranteed way to make money for the bet taker. In a situation where an equal amount of money is bet on each team, the bet taker can simply use the money bet on the loser to pay off those who bet on the winner, being assured of earning the vigourish in profit. However, if there are substantial differences in the amounts of money bet on the favorite and the underdog, the bet taker is exposed to risk. When one team attracts an amount of wagers that is greater than 11/10 the amount wagered on the other team, the bet taker is vulnerable to a loss if that team should win. Sports books usually seek to reduce their exposure to the risk created by such “one-sided action.” Avery and Chevalier (1999) also point out that when lines are balanced, sports books can claim that they have no preference on game outcomes and thus have no incentive to fix games. Given the high levels of scrutiny the sports gambling industry faces from regulatory agencies, the media, and bettors alike, the ability to make such claims of impartiality should not be taken lightly.

The setting of the line in the proper place is of paramount importance for achieving desired betting distributions. Las Vegas Sports Consultants is the firm responsible for setting that number, which is used by the majority of Las Vegas sports books as well as other book making operations throughout the country and the world. Once that line is established, it does not remain static. Sports books desire evenly distributed betting action for the reasons previously described. If the betting action is too heavy on one side of the line, the line will be moved to entice betting on the other side. The line is usually moved in half-point increments, though larger movement is possible in cases of especially high betting disparity.

Though moving the line helps to equalize the betting distribution, it also creates a dangerous situation called a “middle” in the range between the initially posted (opening) line and the adjusted (closing) line. If the line has increased (adjusted > opening) and the final victory margin for the favorite falls in that middle, all bets on the favorite at the opening line and up to the victory margin and all bets on the underdog at the closing line and down to the victory margin are winners. If the line has decreased (adjusted < opening), the opposite would hold true. In both cases, the sports book loses considerably because of the fact that there are winners on both sides. In a game in which the betting volume is especially high, the losses can be near disastrous (the 1979 Super Bowl between the Steelers and Cowboys being an often cited example of such a middle). As a result, large middles are usually avoided whenever possible, even at the expense of equalized betting. For this same reason, lines are less likely to be moved when they sit on a number that is a common margin of victory (such as three or seven) because this movement increases the probability of creating a harmful middle even if the span of the middle is small.

Prior Research on Betting Lines

Point spreads and the betting line have been fertile ground for economic and financial research because of their similarity to financial markets (Brown and Sauer, 1993; Gandar et al., 1998; Strumpf, 2003; Wolfers and Zitzewitz, 2004). In these studies, a number of characteristics of the device have been examined. Though movement of the line is common, the total movement is often small, and rarely more than a few points (Avery and Chevalier, 1999). This suggests that the opening line is very accurate for the purpose of obtaining a desired betting distribution, that creating a large middle is less acceptable than an undesired distribution, or some combination of the two.

The efficiency of the betting market has also been explored extensively. Most studies conclude that they are generally efficient, based on the fact that consistent, long term profitable betting strategies (such as “betting on the favorite” or “betting on home underdogs”) do not exist for the most part (Oorlog, 1995). When such strategies are found in a given data set, they are not usually replicable in subsequent studies across a different sample of games, and even show signs of declining in effectiveness within the primary data set (Gray and Gray, 1997).

In this area that makes up the majority of the analysis done on betting lines, one common element is the focus on outcomes from a betting perspective (Gandar et al., 1988; Brown and Sauer, 1993; Oorlog, 1995; Gray and Gray, 1997). Much less attention has been paid to the efficiency of the line itself. Even when the line is under scrutiny, the frame of reference is often still its predictive capabilities (Gandar et al., 1998). One notable exception to this trend is a study conducted by Avery and Chevalier (1999) which addressed the question of whether NFL football betting lines exhibit consistent biases in their movement in addition to their examination of betting performance. Their findings show that what they call “sentimental betting” can be found to effect line movement even though some portion of bettor sentiment is incorporated into the opening line number. The authors found that bettors tended to favor teams that had made the playoffs the previous season as well as those teams that belonged to the more highly regarded conference (the National Football Conference at that time). Their findings are roughly consistent with our hypotheses insofar as they imply that focal team strength (as indicated by prior success and conference affiliation) holds undue sway over predictions of future success.

Our third study seeks to test more directly our hypotheses regarding focusing biases in comparative judgment in the context of sports betting. As we have noted, the movement of the betting line indicates the direction of public opinion for a game’s outcome. If the line moves in

favor of a team (favorites must win by more points or underdogs can lose by fewer points), bettors have positive overall confidence in that team's ability to cover the spread. If the line moves against a team (favorites must win by fewer points or underdogs can lose by a greater number of points), bettors have negative overall confidence in the team's ability to cover the spread.

Consistent with our hypotheses and with the results of Studies 1 and 2, we expect that people will make more optimistic predictions for the performance of teams on which they are focusing, especially when those teams are good. As a result, the betting lines will tend to move in favor of these teams. The Las Vegas sports betting market is geographically fixed and Nevada law stipulates that all bets must be placed in person, meaning that potential bettors do not all have equal access to the market. Therefore, games played between teams with fan bases more likely to be represented in the Las Vegas market are more likely to show predictable line movement in favor of those teams. The greatest movement will occur when the team involved is a strong team. In particular, we expect that betting line movement will indicate a preponderance of bets being made on strong teams with more fans that are close to Las Vegas.

Method

To test these hypotheses, we examined data from the 2003 and 2004 National Collegiate Athletic Association (NCAA) Division 1-A college football seasons. For each of 117 teams in the league, we recorded the outcome (0=loss, 1=win) and margin of victory or defeat for each game that it played. From these we were then able to compute a measure of team strength: The variable *STRENGTH* totaled each team's average scoring margin over its opponents up to that point in the season.

For the betting line portion of the data set, we obtained archival data from a major handicapping service (DonBest.com, 2004). These data provided us with the opening and closing lines for each game from three major Las Vegas casinos. For subsequent analyses, the casino lines were averaged together to account for any idiosyncratic line formation for a certain game at an individual casino. Line movement was computed as the difference between the average closing and opening lines.

Finally, we included measures for the size of the team's institution and the institution's distance from Las Vegas. The *SIZE* variable was equal to the school's 2001 undergraduate enrollment, which provides a rough proxy for the relative number of likely fans of each team. The institution's distance from Las Vegas (in miles) was changed to the *PROXIMITY* variable by reversing its direction and rescaling it between 0 and 1 such that it was a linear function of the school's distance from Las Vegas. The closest team (University of Nevada at Las Vegas) had a proximity score of 1, and the farthest team (University of Hawaii, 2758 miles away) had a proximity score near 0. Of the games in the initial dataset, several did not include line data (these were games against opponents outside Division 1-A for which no line was posted and some early season games for which line data were unavailable) and therefore were excluded. We also chose to exclude any other games played in the first full week of each season or earlier because up to that point, all teams had not played prior games from which to compute a value for *STRENGTH*. This left a total of 1211 games remaining in the sample.

Results and Discussion

Descriptive statistics. Initial findings are consistent with the results of other betting market studies. The betting line was an adequate predictor of actual outcomes. Opening lines and final lines are both correlated .66 with actual game final score differentials. About half the

time (49.62%) the team favored by the opening line won by more than the line predicted, and half the time it did worse (49.96%). The rest of the time (.42%) the final point spread was equal to the opening line.

Line movement is generally small, with a total range of 14 points (-7.5 to 6.5) from the perspective of favorites. The average movement is slightly toward favorites at 0.0884. Taking the absolute value of line movement in each game and averaging across all games shows that the average amount of line movement is 1.4 points ($SD = 1.2$ points) per game. Correlation between the opening and closing line is .99. Basic betting strategies such as betting on favorites, underdogs, home teams, and away teams are all successful less than the 52.4% needed to break even. This holds at both the opening and closing lines, as summarized in Table 3.

Hypothesis testing. We tested our main hypotheses through regression analyses using line movement as the dependent variable and the game as the unit of analysis. The independent variables included opening line and the game's final score. The other independent variables were school *SIZE*, *PROXIMITY*, *STRENGTH*, and the *PROXIMITY*SIZE *STRENGTH* interaction term for each of the two teams playing. For each game, we took the focal team (Team 1 in the regression) to be that team whose *PROXIMITY*SIZE* coefficient was the higher of the two teams playing. The results of this regression appear in Table 4.

The significant, positive effect of the three-way *PROXIMITY*SIZE *STRENGTH* interaction is consistent with our hypotheses. The results suggest that colleges whose fans more easily could get to Las Vegas to bet (because there were many of them and/or they were close to Las Vegas) saw more betting on their teams, but only when those teams were strong. It is worth noting that although the *PROXIMITY*SIZE *STRENGTH* interaction term is significant for the focal team, it is not significant for the opponent (Team 2).

Naturally, we would expect this focusing effect to have a larger influence on games in which there was a large disparity between the two teams with respect to Las Vegas bettors' focus on them. For example, when Arizona State University played the University of North Carolina, we would expect that Arizona State might have had more bettors in Las Vegas focused on them because the institution is both big and relatively close to Las Vegas. Using this logic, we can divide games into thirds based on the disparity between the two teams in their *PROXIMITY*SIZE* scores. For each third, we can test the relationship between the focal team's *STRENGTH* (as measured by the average points over opponent at that point in the season) and movement in the betting line. The result is three correlations of .16, .24, and .33 (see Figure 4). The first of these correlations is for the 33% of games in which the two teams were most similar in *PROXIMITY*SIZE* scores. All three correlations are significantly different from zero ($p < .01$), and the third is significantly greater than the first, $p < .05$. Consistent with our predictions, when the disparity in bettor focus is greatest, the focal team's strength wields an undue influence on movements in the betting line.

Two additional features of the regression results merit discussion. First, the opening line is a significant influence on line movement. The negative sign on this coefficient suggests that line movement tends to moderate extreme opening lines. When the opening line implies a particularly extreme prediction of the game's outcome, bettors bet on the underdog, making the line's prediction less extreme. Second, while the effect we have hypothesized is statistically significant, it is very small. As previously stated, the line moves an average of 1.4 points per game. The regression we conducted had an R^2 value of .11, meaning that all the predictor variables we included, in combination, only account for 11% of the total line movement. The

unique influence of the *PROXIMITY*SIZE *STRENGTH* interaction term is a small fraction of this line movement.

Our results suggest that focusing biases can be shown to have a predictable effect on line movement. If this pattern in betting behavior exists, why is it not incorporated into the opening line as other such biases are (Avery and Chevalier, 1999)? One possibility is that, because the effect size is small, the betting line would only need to be adjusted by fractions of a point that are below the minimum increment of .5. Also, a line bias in itself is not a problem for the book makers. The inefficiency only becomes a problem for the book maker if it leads to a profitable betting strategy (Gray and Gray, 1997), which does not appear to be the case for the effect we document. Finally, the small size of the effect may help the bias avoid detection from sports books in the first place. In any case, the fact that this bias exists at all in the high-stakes Las Vegas sports betting market is testimony to the effect that focusing effects can have on predictions.

GENERAL DISCUSSION

Knowing how to place winning bets depends on being able to accurately predict the outcomes of games. Knowing how aggressive one can be in a negotiation depends on accurately predicting when one's opponent will concede. Knowing whether to enter a new market depends on forecasting one's performance relative to one's competitors in that market. Knowing whether to invest in additional productive capacity depends on anticipating how one's firm will perform relative to other incumbents in the market. The evidence presented here suggests that human prediction is systematically imperfect. Specifically, when predicting the outcomes of future

competitions, people tend to attend too closely to a focal competitor and attend insufficiently to the influence of the opponent.

In this paper, we have demonstrated this effect several different ways. Each of the three studies finds similar patterns in the predictions of the outcomes of athletic contests. In each case, strong teams were predicted to be more likely to win by those focusing on them than by those not focusing on them. The first study examined predictions of who would win match-ups in intramural soccer competitions and found that when making predictions regarding their own teams (on whom they were presumably focusing), people were significantly more optimistic than were others, but only when the team was good. The second study replicated this effect when respondents were asked to predict the performance of professional basketball teams of which they were not members, but whom they happened to be supporting or otherwise following. The third study found support for the effect in the movement of the betting line from sports books in Las Vegas casinos. This third study is especially important, given the high stakes involved in sports betting as well as the large number of people poised to take advantage of inefficiencies in the market to make money (Manteris and Talley, 1991). At the same time, field studies such as this one are also necessarily fraught with problems. It is based on a number of assumptions, including the fact that alumni of a university are fans of (and focus on) its football team, and that proximity to Las Vegas is a good proxy for the frequency with which these individuals bet in the Las Vegas sports books of the three casinos from which we were able to obtain data. Nevertheless, the consistency of the results of the third study in conjunction with the results of the previous two and prior laboratory research findings (Moore and Kim, 2003; Moore, in press) do offer some assurance.

In addition, we should point out something that we did not find. Although our theory of focusing biases in comparative judgment would predict that those focused on weak teams would predict them more likely to lose than would those not focused on them, we did not find this effect in our studies. We believe that the reason for this failure is not that the effect only works in the positive domain. After all, numerous studies have already documented the tendency for people to believe that they are actually *below* average on difficult tasks (Kruger, 1999; Moore and Kim, 2003; Windschitl, Kruger, and Simms, 2003; Moore and Small, 2004). A more plausible explanation for our failure to find the worse-than-average effect in our sample is that it was cancelled out by a general tendency toward overoptimism. Abundant evidence has found that wishful thinking leads to more optimistic predictions for one's favored team (Babad, 1987; Babad and Katz, 1991; Price, 2000). This tendency can exist concurrent with the focusing bias we have described. Such concurrence would mean that while predictions regarding the future performance of one's favored team are consistently overoptimistic, those predictions are also more strongly influenced by the focal team's abilities than are predictions for other teams.

We should mention a potentially rational explanation for the effect we document. This explanation points out that people are usually better informed about their favored team than they are about other teams. If people knew nothing about any team and were asked to make predictions about future matches, it might be quite sensible for them to assume a 50% chance of winning. To the extent that people know about one team, their predictions of that team's future performance might deviate from 50%, even when ignoring other teams' abilities. If the team is excellent, then it might make sense that the team would do well. Even if the focal teams' abilities were useful for predicting the strength of its competitors (due to sorting into different leagues, such as in Study 1), the correlation between the strength of the focal team and the

strength of its opponents would be less than one. Therefore, it might still be sensible to assume that excellent teams will be better than average and that poor teams will be worse than average. It is true that a great deal of better-than-average and worse-than-average effects can be accounted for by this explanation (see Moore and Small, 2004), including the effects we document in this paper. Nevertheless, this explanation has trouble accounting for all the results we present. The results it has the most trouble accounting for come from the second study. Even after controlling for respondents' self-reported knowledge of a team, we found that focusing on the team magnified the effect of the team's prior performance on predictions of future performance.

The effects we document suggest a systematic blindness in strategic vision. All three studies suggest that when making predictions about future competitions, people neglect to make adequate consideration of the competition. We do not believe that such inattention to the competition is unique to athletics. Evidence suggests that negotiators tend to focus too much on themselves and too little on understanding the other side (Neale and Bazerman, 1983; Bazerman and Carroll, 1987; Ball, Bazerman, and Carroll, 1991; Bazerman et al., 2000). This makes it difficult for the parties to achieve joint gains by integrating their interests with those of the other side (L. Thompson, 1990; L. Thompson and Hastie, 1990). Self-focus also can account for the finding that negotiators tend to believe that constraints that affect both sides equally will hurt them more (Moore, 2004b).

Our theory might also be able to help account for a number of other empirical regularities. In sports betting, it is well known that betting volumes increase dramatically as the quality of the competition goes up: college sports receive fewer bets than do professional sports; games between weak teams receive fewer bets than do games between strong teams; and regular-season games receive fewer bets than do post-season games, in which only the best teams are

represented (Manteris and Talley, 1991). The football game that sees the highest betting volume of all is the game between the two strongest professional teams: the Superbowl (Manteris and Talley, 1991). Some of this could also be explained by it being more “fun” to bet on games with stronger competitors. However, it is entirely inconsistent with bettors’ interest in betting to win money.

Other evidence suggests that entrepreneurs may be vulnerable to these same sorts of myopic biases when they decide whether to enter new markets (Moore and Cain, 2004; Moore, Oesch, and Zietsma, 2004). This might help explain why rates of entry are often highest in “simple” industries such as restaurants, bars, retail clothing stores, and hobby shops (U.S. Small Business Administration, 2003). These are the industries in which a large number of people imagine that they know how to run a successful business, both because they have personal experience as customers and because many people share the required basic skills. However, the consequences of high rates of entry are intense competition and high rates of exit.

Of course, many industries have developed geographical consolidation such as that found in auto manufacturing in Michigan and computer technology in California’s Silicon Valley. These local concentrations occur in part because the visibility of local successes helps build the confidence of other potential entrants (Sorenson and Audia, 2000). However, this has the ironic result of producing new entrants in precisely those locations where they are most likely to encounter strong competitors. Perceptions of difficulty are also likely to change over time as industries go through phases of legitimation and institutionalization (Hannan and Freeman, 1989). High rates of successful entry can often make entry appear easy, and myopic entrepreneurs may be more likely to enter an industry in this phase. These businesses are also those most likely to fail when increasing organizational density leads to increased competition.

Research on density delay has obtained results consistent with these expectations (Carroll and Hannan, 1989; Hannan and Carroll, 1992).

Our results offer a clear practical message to managers, investors, and sports bettors. It is a lesson that is both obvious in its truth and easily forgotten: Understand the competition. As Sun Tzu (500 B.C./2002) is said to admonished military planners, “Know thine enemy as thyself.” More recently, in an interview in which he was discussing the American failure understand its enemy in Iraq, then Secretary of State Colin Powell quipped that “even the most brilliant strategist must occasionally take into account the presence of an enemy” (O'Rourke, 2004). As fundamental a lesson as this is, it is routinely ignored. Human intuition is imperfect, narrow in its attention, and bounded in its capacity. When people make strategic decisions relying more heavily on their intuitions than on systematic and careful analysis, the result is that they will focus too much on what they know: themselves, their teams, and their organizations. Understanding how these biases operate is an essential step in reducing their costs, and we hope that the present research can contribute to this goal.

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Table 1

Means, standard deviations, and bivariate correlations for select variables (Study 2).

Variable	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Predicted second half win percentage	.48	.19										
2. Actual second half win percentage	.50	.16	.49									
3. First half win percentage	.50	.13	.64	.71								
4. Record in last ten games	.50	.17	.48	.52	.62							
5. Team's second half opponents' strength	.50	.03	.02	-.08	.07	-.03						
6. Team's second half home game percentage	.50	.04	-.09	.21	-.18	-.07	-.01					
7. Knowledge of focal team (1 to 5)	2.61	1.25	.05	.08	.06	.02	-.02	.04				
8. Rooting interest (-2 to 2)	-.05	.78	.04	-.01	.02	.00	.03	-.03	.20			
9. FOCUS (0 to 2)	1.29	.58	.19	.11	.11	.06	.00	.00	.37	-.02		
10. FAN (0 to 1)	.12	.33	.16	.06	.09	.04	.04	-.02	.40	.61	.61	
11. FOCUS*First half record	.65	.37	.45	.42	.54	.34	.04	-.07	.34	.00	.87	.54

Table 2

Results of regression analyses using (1) participants' predictions of teams' second half winning percentages and (2) actual second half winning percentages as dependent variables (Study 2).

	(1) Dependent Var.: Participants' predictions of 2 nd half record			(2) Dependent Variable: Teams' actual 2nd half records		
	Unstandardized Coefficients		Standardized Coefficients	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Err.	Beta	B	Std. Err.	Beta
Constant	-.029	.058		-.384	.050	
Actual second half win percentage	.025	.021	.021	-	-	-
First half win percentage	.703	.046	.479*	.894	.037	.706*
Record in last 10 games	.144	.015	.130*	.078	.014	.082*
Team's 2 nd half opponents' strength	-.057	.074	-.009	-.726	.064	-.126*
Team's 2 nd half home game pctage	.029	.063	.006	1.455	.049	.337*
Knowledge of focal team	.023	.004	.149*	.005	.003	.038
Rooting interest	.021	.008	.071*	-.002	.007	-.008
FOCUS	-.002	.017	-.007	.004	.015	.015
FAN	-.021	.019	-.036	-.017	.017	-.033
FOCUS*First half record	.058	.028	.115*	.021	.025	.047

* $p < .05$

Table 3

Success rate for various basic betting strategies (Study 3).

Strategy Description	Percentage of winning bets at opening line	Percentage of winning bets at average closing line
Bet on home team	51.61%	52.11%
Bet on away team	46.74%	47.23%
Bet on favorite	49.62%	49.12%
Bet on underdog	49.96%	50.46%
Bet on home favorite	51.54%	51.70%
Bet on home underdog	51.30%	52.16%

Table 4

Results of a regression analysis predicting movement in the betting line (Study 3).

	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Std. Error	Beta		
(Constant)	-0.148	0.214		-0.690	0.490
Actual final score differential	0.010	0.003	0.116	3.179	0.002
Opening line	-0.029	0.006	-0.218	-4.739	2.41 x 10 ⁻⁶
Team 1 <i>SIZE</i>	1.63 x 10 ⁻⁶	6.71 x 10 ⁻⁶	0.009	0.243	0.808
Team 1 <i>PROXIMITY</i>	0.163	0.337	0.019	0.483	0.629
Team 1 <i>STRENGTH</i>	0.029	0.008	0.227	3.671	0.000
Team 1 <i>PROX.*SIZE*STRENGTH</i>	1.11 x 10 ⁻⁶	4.34 x 10 ⁻⁷	0.150	2.554	0.011
Team 2 <i>SIZE</i>	-3.8 x 10 ⁻⁶	7.03 x 10 ⁻⁶	-0.018	-0.544	0.587
Team 2 <i>PROXIMITY</i>	0.028	0.367	0.003	0.076	0.940
Team 2 <i>STRENGTH</i>	-0.027	0.007	-0.208	-3.634	0.000
Team 2 <i>PROX.*SIZE*STRENGTH</i>	-4.4 x 10 ⁻⁷	6.47 x 10 ⁻⁷	-0.037	-0.680	0.497

Figure 1. Estimated probability of winning post-season matches as a function of teams' regular season records (number of wins minus number of losses) and who was making the prediction (Study 1).

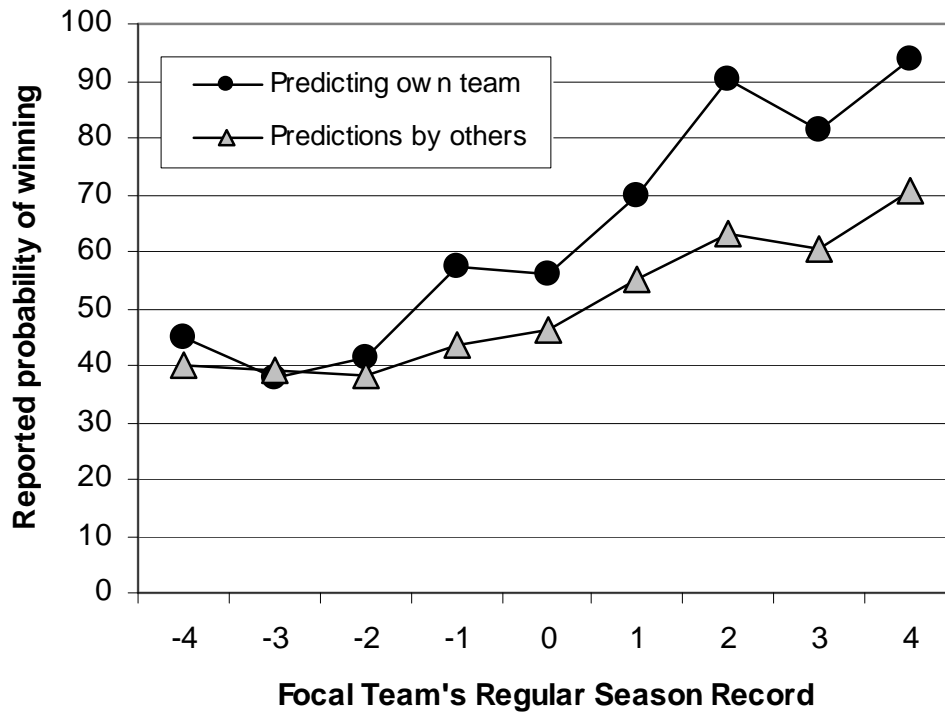


Figure 2. Estimated probability of winning as a function of league and who was making the prediction (Study 1).

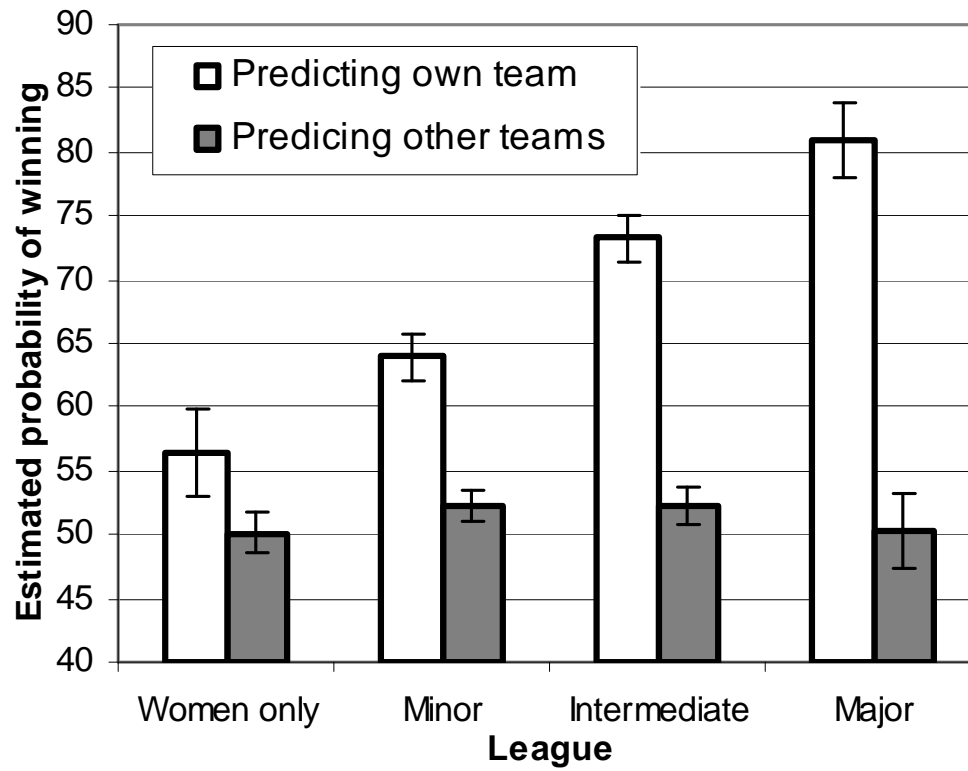


Figure 3. Percentage of games won in first and second halves of the season, as well as predictions made (in mid-season) about performance in the second half, as a function of who participants were rooting for.

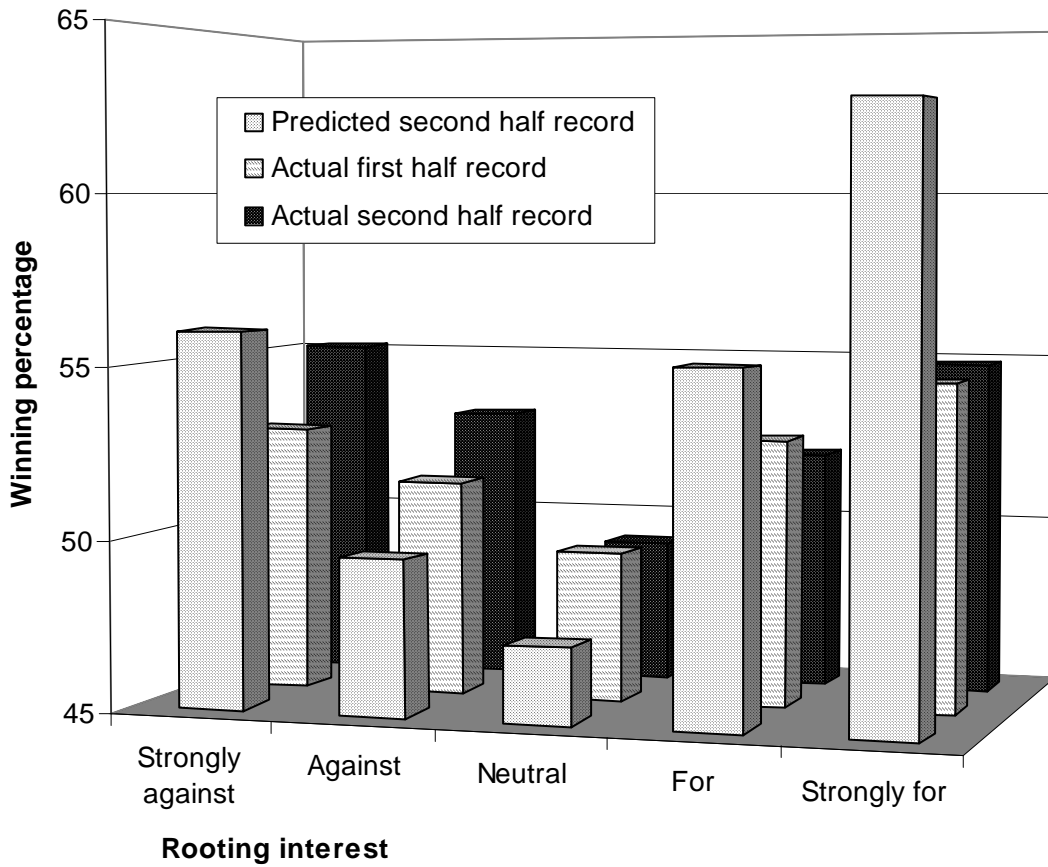
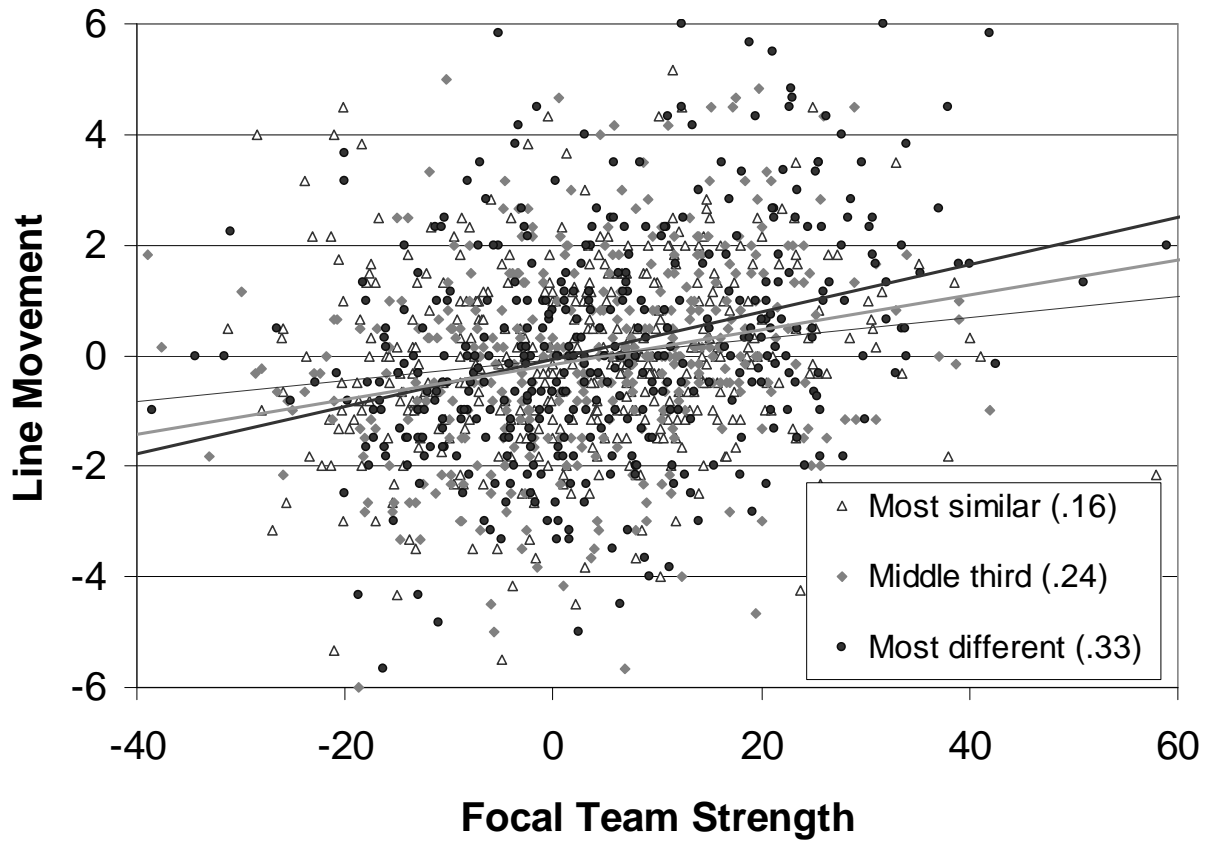


Figure 4. Line movement as a function of focal team strength, sorting games into three groups based on the similarity between the two teams with respect to bettors' focus on them (as measured by the *PROXIMITY*SIZE* variable).



Appendix
Examples of Betting Line Scenarios and Outcomes

The following scenarios involve a hypothetical game between Michigan and Ohio State in which Michigan is favored to win by the given number of points at both the opening and closing line. A bet on Michigan (the favorite) wins if Michigan wins the game and its margin of victory minus the point spread is greater than zero. Similarly, a bet on Ohio State (the underdog) wins if Ohio State wins the game or its margin of defeat plus the point spread is greater than zero. If the margin of victory/defeat is equal to the point spread, the game is a “push,” neither bet wins or loses, and a bettor’s wager is refunded.

Scenario 1: Favored Team Wins and Covers

Team	Opening Line Point Spread	Closing Line Point Spread	Final Score	Margin of Victory/Defeat
Michigan	- 2	- 5	24	7
Ohio State			17	- 7

Results: A bet on Michigan at either the opening or closing line wins because its ($7 - 2 > 0$ and $7 - 5 > 0$). A bet on Ohio State at either the opening or closing line loses ($- 7 + 2 < 0$ and $- 7 + 5 < 0$).

Scenario 2: Favored Team Wins but Fails to Cover

Team	Opening Line Point Spread	Closing Line Point Spread	Final Score	Margin of Victory/Defeat
Michigan	- 2	- 5	14	1
Ohio State			13	- 1

Results: A bet on Michigan at either the opening or closing line loses ($1 - 2 < 0$ and $1 - 5 < 0$). A bet on Ohio State at either the opening or closing line wins ($- 1 + 2 > 0$ and $- 1 + 5 > 0$).

Scenario 3: Favored Team Wins, Outcome is a Push

Team	Opening Line Point Spread	Closing Line Point Spread	Final Score	Margin of Victory/Defeat
Michigan	- 3	- 3	17	3
Ohio State			14	- 3

Results: A bet on Michigan at either the opening or closing line is a push ($3 - 3 = 0$). A bet on Ohio State at either the opening or closing line is a push ($- 3 + 3 = 0$).

Scenario 4: Favored Team Wins and There is a Relevant Middle

Team	Opening Line Point Spread	Closing Line Point Spread	Final Score	Margin of Victory/Defeat
Michigan	- 2	- 5	17	4
Ohio State			13	- 4

Results: A bet on Michigan at the opening line wins ($4 - 2 > 0$), but a bet on Michigan at the closing line loses ($4 - 5 < 0$). A bet on Ohio State at the opening line loses ($- 4 + 2 < 0$), but a bet on Ohio State at the closing line wins ($- 4 + 5 > 0$). This is the prime example of a costly middle in which there are winning bets on both sides of the line.