

**Do Employees Care about their  
Relative Position? Behavioural Evidence  
Focusing on Performance**

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## ABSTRACT

Do employees care about their relative (economic) position among co-workers in an organization? And if so, does it raise or lower their performance? Behavioral evidence on these important questions is rare. This paper takes a novel approach to answering these questions, working with sports data from two different disciplines, basketball and soccer. These sports tournaments take place in a controlled environment defined by the rules of the game. We find considerable support that positional concerns and envy reduce individual performance. In contrast, there does not seem to be any tolerance for income disparity, based on the hope that such differences signal that better times are under way. Positive behavioral consequences are observed for those who are experiencing better times.

*Keywords:* Relative income, positional concerns, envy, social comparison, relative derivation, performance

*JEL classification:* D000, D600, 8222, 9210, L830

*“Throughout history, in all stages of cultural development, in most languages and as members of widely differing societies, men recognized a fundamental problem of their existence and have given it specific names: the feeling of envy and being envied” (Schoeck 1966: 3)*

## INTRODUCTION

Calm can be maintained in organizations often only by keeping peoples’ salaries secret (Layard 2003). In China, model workers spend their bonuses on treating their work colleagues out to a good meal in order to avoid harassment by them (Elster 1991). Francis Bacon (1890) writes in his *Essays or Counsels, Civil and Moral* that “Men of noble birth are noted to be envious towards new men when they rise. For the distance is altered, and it is like a deceit of the eye, that when others come on they think themselves go back” (p. 57). Schoeck (1966) reports several homicides committed by people overwhelmed by feelings of envy:

“In 1963, after a basketball game in New York City, a drab-looking day labourer drove his car at the good-looking hero who had won the game and who was standing on the pavement with his parents and friends. The murderer, who had no interest whatever in the losing team, declared that he just could not stand seeing the glamour of that handsome athlete” (p. 129).

“In 1953 a middle-aged spinster in Munich took her friend’s baby out for a walk in its pram. Suddenly she pushed baby and pram into the Isar River. The investigation, in which the psychiatrist Ernst Kretschmer took part as expert witness, disclosed that the culprit

was suddenly overcome with envy of her friend's happiness which the child symbolized" (p. 130).

Envy means negative inequity aversion (Dunn and Schweitzer 2004) and can be characterized by feelings of inferiority, subjective injustice, and longing (Parrott and Smith, 1993). It is the strongest emotional reaction to being outperformed when performance is important to one's self-concept (Salovey and Rodin, 1984). Envy often leads people to devalue those they envy, and can even create *schadenfreude* or pleasure at another's misfortune (Brigham et al. 1997). An envious person may "prefer that others have less, and he might even sacrifice a little of his own wealth to achieve that end" (Zeckhauser 1991: 10). Such behavior has been found in laboratory experiments, such as ultimatum games (see, e.g., Kirchsteiger 1994). An envious person increases his utility by destroying some of the envied person's assets, even if such an action carries its own costs (*cutting off one's nose to spite one's face*). This implies that organizational chains are only as good as their weakest link, and that it is relatively important to take the negative consequences of positional concern and envy into account. Schoolteachers sometimes ask parents not to pack special treats in children's lunches because other classmates may be envious (Elster 1991). Similarly, school uniforms help to reduce possible envy among pupils.

On the other hand, one can argue that envy and positional concerns lead to better performance, as they raise the incentive to achieve a similar status. A positional arms race is provoked through the process of rivalry (see Landers et al. 1996). Promotion tournaments aim at provoking 'rat races' to make the tournament more attractive. Several studies have shown that players respond to the incentives created by a tournament<sup>1</sup>.

Other theories stress that people keep on going because of the hope that better times are under way for them. According to Hirschman (1973), individuals are willing to give credit to and draw gratification from the progress of others for a while, enabling them to suspend envy. He calls this gratification 'tunnel effect', stressing that such progress generates *information* about a more benign external environment:

"Suppose that I drive through a two-lane tunnel, both lanes going in the same direction, and run into a serious traffic jam. No car moves in either lane as far as I can see (which is

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<sup>1</sup> See also, for example, Nalebuff and Stiglitz (1983), Green and Stokey (1983), O'Keefe, Viscusi and Zeckhauser (1984), Rosen (1988), McLaughlin (1988), Rees (1992), Prendergast (1999).

not very far). I am in the left lane and feel dejected. After a while the cars in the right lane begin to move. Naturally, my spirits lift considerably, for I know that the jam has been broken and that my lane's turn to move will surely come any moment now. Even though I still sit still, I feel much better off than before because of the expectation that I shall soon be on the move" (p. 545).

It is not only about those who experience a relative disadvantage. Greenberg (1988), for example, found that managers who were moved to higher-status offices increased their performance. Thus, a relative advantage can boost performance. As long as such a prestige effect is stronger than a negative positional concern effect, there is no need for a society, organization or company to slow down the performance of such superstars. Currently, there is considerable anecdotal evidence with regard to positional concern. However, empirical evidence about its *behavioral* relevance remains scarce.

The main contribution of our study is to provide some answers to the question: How do people react in a community setting to an increasing difference in income? Do they perform better or worse? We explore the issue in a competitive environment where employees acting in a team experience increasing income differences. To collect as accurate evidence as possible, we use two team sports, soccer and basketball, which today are a special type of for-profit firms. Using sports data has several advantages compared to other data sources. The data has low variable errors. Performance is clearly observable and is free of discrepancies, compared to frequently used performance variables, such as GDP. Furthermore, the environment is comparable to field experiments, due to the fact that a game takes place in a controlled setting. All players are faced with the same rules and regulations. Thus, when investigating the connection between relative concern and performance, many factors can be controlled for. The job profile is similar and social comparisons are likely to happen. In addition, transparent salary information is available. The evidence obtained is relevant for employees in corporations, as the majority work in teams, to some extent like sports teams. Our result, that a relative disadvantage in income induces employees' individual performance to worsen, is of direct relevance to the situation in firms in which team work is important – and that applies to a large number of firms today.

The following section II provides the theoretical background and the hypotheses. Section III presents the empirical results and Section IV finishes with theoretical and managerial implications and some concluding remarks on study limitations and future research.

## **POSITIONAL CONCERNS**

### **Overview**

Leading historical figures, such as Adam Smith (1759), Karl Marx (1849), Thorstein Veblen (1899) or James Duesenberry (1949), have long expressed the importance of the relative position and social concerns. Nevertheless, the standard literature pays little attention to the consequences of relative position. Accordingly, Senik (2004), in providing an overview of the literature, points out that “it is surprising that in spite of the large theoretical literature on relative income and comparison effects [...] empirical validation of this conjecture is still scarce” (p. 47).

Research on happiness (for example, Easterlin 1974, 1995, 2001, Clark and Oswald 1996, Ng 1997, McBride 2001, Frey and Stutzer 2002a,b, Stutzer 2004, Layard 2003, Luttmer 2005, Ferrer-i-Carbonell 2005, Frey 2008) has stressed, and found strong empirical support for the importance of relative position. However, some researchers criticize these studies, as they do not address the behavioral consequences. In addition, the issue of finding an adequate reference group has led to controversy. Most studies do not rely on data to explore close reference groups, such as neighbors, co-workers, family or friends. Using sports data to compare teammates provides the possibility of reducing such shortcomings.

The pay structure in organizations has important behavioral consequences in work organizations (Harder 1992). Part of the organizational literature emphasizes the link between pay and managerial performance in organizations. However, many studies have been hindered by the lack of data in the past. Lazear (2000: 1346) points out that: “Much of the theory in personnel economics relates to effects of monetary incentives on output, but the theory was untested because appropriate data were unavailable”<sup>2</sup>. Therefore, a number of studies use sports data – where performance can be quite well measured – from disciplines like baseball (Hill and Spellman 1983, Scully 1974), basketball (Wallace 1988, Kahn and Sherer 1988), golf (Ehrenberg

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<sup>2</sup> Abowd (1990), Jensen and Murphy (1990), and Gibbons and Murphy (1990) investigate the relationship between pay and managerial performance or corporate returns, or Asch (1990) for Navy recruiters’ reactions to different incentive plans.

and Bognanno 1990a, 1990b; Melton and Zorn 2000; Orszag 1994), horse racing (Ferne and Metcalf 1999; Lynch and Zax 1998), tennis (Sunde 2003), car racing (Becker and Huselid 1992) and running (Maloney and McCormick 2000) in order to test existing theories in promotion tournaments. Such evidence from sports data supports the proposition that the overall level of performance rises with the monetary rewards paid. This paper contributes to the growing literature that investigates the link between pay and performance. Contrary to previous studies, we also investigate the relevance of the relative income position.

### **Relative Income Situation**

People constantly compare themselves within the organization and care greatly about their relative position, which influences individual choices. The literature so far has explored income as the key variable for positional concerns. Thus, not only is the absolute level of an individual's situation important (e.g., pay), but also the relative position. Frank and Sunstein (2001: 347) point out that "[...] positional concerns typically loom larger with income than with the goods that regulation attempts to provide (safety, leisure time, leave to take care of children and ailing relatives)." Zeckhauser (1991) observes, "In many workplaces, including most universities, salaries are not publicized. Many of us would find our welfare substantially diminished, even though our income remained the same, if we discovered that our colleagues were earning more than we were. In part that is because the discovery would reveal the boss's view of us. In part our reaction would be merely envy." (p. 9). Surveys of employers and employees suggest that salaries depend on what employees think other people are paid. Furthermore, their perception of their relative position has a considerable effect on their morale (Frank and Sunstein 2001).

With income as a reference group, some researchers have used hypothetical questions regarding choice between alternative states or outcomes, where the choices allow for checking out relative positional concerns. Imagine a situation reported by Frank and Sunstein (2001: 336) of two hypothetical worlds. In world A, you can earn \$110'000 per year while others can earn considerably more (\$200'000) and in world B, you can earn \$100'000 per year while others can earn less (\$85'000). In a traditional economic approach, world A would be better because it offers higher absolute consumption for its people. But the choices made reveal a different picture. A substantial proportion of people opt for world B. Frank (1985) also used a comparison between earning \$100'000 as a high-income inhabitant of Earth, or emigrating to another planet and

earning \$1'000'000, but being among the worst off in that society. Similarly, Solnick and Hemenway (1998: 377) asked 257 faculty students and staff members at Harvard School of Public Health which world they would prefer – world A: Your current yearly income is \$50'000; others earn \$25'000; world B: Your current yearly income is \$100'000; others earn \$200'000. The results indicate that approximately 50 percent of the respondents preferred world A, in which they had half the real purchasing power but a higher relative income position. Zeckhauser (1991: 10) asked his American students whether they would prefer to find that per capita income is \$25'000 in Japan and \$24'000 in the United States, or \$22'000 in Japan and \$23'000 in the United States. Many chose the latter and he links such results to feelings of envy. Tversky and Griffin (1991: 313) confronted sixty-six undergraduate students with the following situation: Imagine that you have just completed a graduate degree in communications and you are considering one-year jobs at two different magazines: a) At Magazine A, you are offered a job paying \$35'000. The other workers, who have the same training and experience as you, are earning \$38'000: b) At Magazine B, you are offered a job paying \$33'000. The other workers, who have the same training and experience as you, are earning \$30'000. Approximately half of the subjects were asked which job they would choose and the other half were asked which job would make them happier. 85 percent of the first group of students said they would choose the job with the higher absolute salary and the lower relative position, but interestingly, 62 percent of the second group anticipated higher job satisfaction in the job with the lower absolute salary but the higher relative position.

### **Reference Group**

If people compare themselves with other individuals then, the key question is: Who is the reference group? Festinger (1954) emphasizes that people do not generally compare themselves with the rest of the world, but with a much more specific group, typically with others they see as being similar to themselves or, in his words, 'close to one's own ability' (p. 121). Similarly, soldiers in World War II seem to have made comparisons primarily with members of their own military group (Stouffer 1949). In his *Rhetoric* (book II, chapter 10), Aristotle stresses that envy is felt only towards those people who are our equals or our peers:

“Potter against potter.



We also envy those whose possession of or success in a thing is a reproach to us: these are our neighbours and equals; for it is clear that it is our own fault we have missed the good thing in question; this annoys us, and excites envy in us. We also envy those who have what we ought to have, or have got what we did have once. Hence old men envy younger men, and those who have spent much envy those who have spent little on the same thing. And men who have not got a thing, or not got it yet, envy those who have got it quickly”.

Similarly, Francis Bacon writes in his *Essays or Counsels, Civil and Moral* that proximity defines the reference group:

“... near kinsfolks, and fellows in office, and those that have been bred together, are more apt to envy their equals when they are raised. For it doth upbraid unto them their own fortunes, and pointeth at them and cometh oftener into their remembrance, and incurreth likewise more into the note of others.”

Workers within the same organizations have an incentive to compare themselves with co-workers. In our context, soccer and basketball players, like in other team sports, compare themselves with their teammates. It is therefore a strong comparative advantage to work with sports data to be able to build an adequate reference group.

### **Theoretical Model**

There are several countervailing theories about how income differences influence performance. We will introduce several theories. The organizational literature shows that employees care about justice. We assume in our model that performance within an organization is not only driven by absolute income but also by relative position. We can therefore write the following performance function of a worker  $i$ :

$$P_i = P(A(y_i), R(y_i, y_j)) \quad (1)$$

Performance in such a model is ceteris paribus a function  $A$  of own income  $y_i$ . The value of the function  $A(y_i)$  gives information about how the absolute income is used to perform or, in other

words, how much performance is derived from an absolute income. We assume that the absolute income has a positive impact on individual performance ( $\partial P/\partial A > 0$ ). The value of  $R(y_i, y_j)$  captures the impact of the relative income on performance. We assume that relative income or social comparison is a function of the difference in income:  $R = f(y_i - y_j)$ . A similar approach has been used to explore, e.g., happiness (Ferrer-i-Carbonell 2005, Wunder and Schwarze 2006) and other social comparisons (e.g., Dakin and Arrowood 1981, Loewenstein, Bazerman and Thompson 1989, Fehr and Schmidt 1999). Wunder and Schwarze (2006), for example, emphasize that social status (relative income) can be seen as an important yardstick of self-approval and also captures the information about whether individuals are esteemed by their reference group. Our function  $R$  can be modeled the following way:

$$R = \beta_{(A,B)} \left( \frac{\sum_{j=i+1}^n y_j^B}{n-1} - y_i \right) \quad (2)$$

The value is positive if the *average* income of the reference group within an organization (e.g.,

teammates)  $\left( \frac{\sum_{j=i+1}^n y_j^B}{n-1} \right)$  is larger than the individual income  $y_i$ . This means that player  $i$  is

experiencing a relative disadvantage. On the other hand, player  $i$  is in a situation of a relative income advantage if the value is negative.  $\beta_A$  is a weighting variable in case an individual has a relative income advantage and  $\beta_B$  is the corresponding situation in case an individual has a relative income disadvantage.

In the following part, several hypotheses are formed, which are then tested in the empirical part of the paper.

## HYPOTHESES

### Positional Concerns and Behavior

The theory of social comparison (see Festinger 1954) and the theory of relative deprivation (Stouffer 1949) show that comparisons with others are an important phenomenon. Relative deprivation theory investigates interpersonal and inter-group relations and comparisons. It stresses that a lower perception of one's own (group) status or one's own welfare in relation to

another person (group) can be the source of hostility towards the other individuals or groups. A person may get frustrated when his/her situation (e.g., individual earnings) falls relative to the reference group. The person feels deprived. If improvement of the situation is slower than expected, the experience of frustration can even lead to aggression (see, e.g., Walker and Pettigrew 1984). The term relative deprivation is used to refer to the negative feelings that arise from having less than other people, and it is often said to have negative effects not only on mental and physical well-being, but also on behavioral outcomes, such as pro-social behavior (López Turley 2002).

Similarly, an envious person may “prefer that others have less, and he might even sacrifice a little of his own wealth to achieve that end” (Zeckhauser 1991: 10). Envy has also been incorporated to explain experimental findings using ultimatum games (Kirchsteiger 1994). Frank and Sunstein (2001) stress the relevance of the relative position: “... preference for good relative position does not explain all of what occurs in the game; ensuring a fair outcome, which may or may not call for good relative position, is often the driving factor. But relative position also counts for many participants, so much so that ‘difference aversion’ appears to motivate a significant percentage of participants” (p. 344). Elster (1991) goes a step further, criticizing that the experimental evidence found in ultimatum games is characterized as fairness: “... ‘envy’ would sometimes be more appropriate for analogous behavior in real life” (p. 66). Thus, the welfare of an envious person increases by destroying some of the assets of the envied person, even if such an action carries high personal costs. Thus, a negative sum interaction is started. The performance of those with lower income may decrease due to frustration (“it *could* have or *should* have been me”). As a consequence, performance is lowered. It is even possible that players with a lower salary express their resentment of the players with a higher salary by, for example, not passing the ball so frequently to reduce their performance. Inequality can lead to workplace sabotage (Ambrose, Seabright and Schminke 2002), employee theft (Greenberg 1988) or stress symptoms (Cropanzano, Bowen and Gilliland 2005). Mui (1995) criticizes that “the behavioral implications of envy have not received much attention in the economics literature” (p. 311). This paper attempts to reduce this shortcoming.

The following hypotheses refer to the behavioral consequences of relative depreciation and envy. The first hypothesis proposes a negative motivational effect on performance.

*Hypothesis 1: The performance of the players declines if disadvantage in the relative income position increases ( $\beta_B < 0$ ).*

### **Keeping up with the Stars**

A contrasting theory argues that large income differences lead to better performance, as they raise the incentive to achieve a similar status. A positional arms race is provoked through the process of rivalry (see Landers et al. 1996). Promotion tournaments aim at provoking a rat race in order to make the competition more attractive. A relative income disadvantage is taken to motivate and to generate the ambition to improve the current situation. A disadvantage in the relative income position leads to the ambition of being able to reach the stars within an organization. Better-paid colleagues serve as models of success. This leads to the following hypothesis:

*Hypothesis 2: The performance of the players increases if disadvantage in the relative income position increases. ( $\beta_B > 0$ ).*

On the other hand, not being able to keep up with their teammates may lead to frustration, resignation, and even shame. Such players may feel it is impossible to “keep up with the stars” and give up trying to reach them. They may also see the income position as a proxy for the level of appreciation. Players dislike being in a lower income position, because the relative position may signal that they and their future prospects are lowly evaluated by others. Such perceptions and signals harm their relationship with others, and affect their self-conception and performance (Kräkel, 2000). They may be respected less by their co-workers. A lower level of teammates’ trust may also affect their involvement within the game. As a consequence, their performance level decreases, as formulated in the third hypothesis:

*Hypothesis 3: A decrease in the relative income position leads to a decrease in performance ( $\beta_B < 0$ ).*

### **Waiting for Better Times**

Hirschman (1973) also refers to another effect, namely *tolerance*. He stresses that society’s tolerance for income disparities is substantial. Individuals are willing to give credit and draw

gratification from the progress of others for a while, thereby overcoming envy. This ‘tunnel effect’ stresses that such progress generate *information* about a more benign external environment. The positive effect is driven by the hope that the relative disadvantage may disappear in the future (“better times are under way for me also”). Thus, the negative comparison effect is dominated by a positive information effect. Senik (2008) finds support that the reference income provides a source of information rather than a ground for comparison in post-transition countries. Individuals use the income of other people in a cognitive information manner rather than as a reason for comparison due to rapid and unstable environmental changes (Senik 2004). Senik finds that, in the United States, if one’s professional peers get an income increase, this leads to a positive feeling (*life is exciting*) rather than a negative feeling (*life is dull*). On the other hand, in Western Europe, the comparison effect is found to dominate the information effect. The tolerance effect leads to the fourth hypothesis:

*Hypothesis 4: A decrease in the relative income position leads to an increase in individual performance ( $\beta_B > 0$ ).*

### **Enjoying Better Times**

One can, on the other hand, argue that an increase in the relative income position increases work performance. Players may see it as a sign that their performance is appreciated, and such a situation is perceived as some kind of reward. They may gain satisfaction from the improvement in their relative position, which motivates them to perform better. Greenberg (1988), for example, found that managers who were moved to higher-status offices increased their performance. Thus, a relative advantage boosts their performance. This situation can also be interpreted as a prestige effect (Wunder and Schwarze 2006). Players perceive the approval of other persons within their environment, which has a positive effect on their performance. This is formulated in the fifth hypothesis:

*Hypothesis 5: An increase in the relative income position leads to increased performance ( $\beta_A > 0$ ).*

## METHOD

### Data

This paper uses a unique data set of professional basketball and soccer players. We explore the two leagues separately, using the same period of investigation (seasons 1995/1996 till 2003/2004)<sup>3</sup>. Empirical studies of the effects of income differences on managerial behavior have been hindered by the lack of data on individual performance and the lack of publicly available income data. By contrast, in certain sports such as soccer and basketball, individual and team performance is well defined and can be readily observed.

### Basketball

The data used refers to the most prestigious league, namely the National Basketball Association (NBA). There are 29 teams in the NBA, divided into two conferences (Eastern and Western). Within the Eastern Conference are the Atlantic Division and the Central Division. Within the Western Conference are the Midwest Division and the Pacific Division. Three Divisions each have seven teams, and the Central Division has eight teams. Since 1969, each NBA team has to play an 82-game regular season schedule, playing 41 games at home and 41 away. In general, each team plays four games (two home and two away) against every team in its conference, and two games (one home and one away) against every team in the other conference. Each team is allowed a maximum of 12 active players on its roster. Sixteen of the NBA's 29 teams qualify for the NBA playoffs. To achieve adequate comparison, the analysis only focuses on the regular season.

### *Measuring Players' Pay*

Basketball games allow us to generate a broad data set, including players' salaries. A large amount of the data has been collected from the website [usatoday.com](http://usatoday.com). Additional sources were used to cover 9 seasons between 1995/1996 and 2003/2004. The data set covers not only the contract salary, but also additional salary components, such as bonuses.

### *Measuring Players' Performance*

The empirical data has low variable errors. Performance is clearly observable and is free of discrepancies. Furthermore, soccer games are comparable to field experiments, due to the fact

that a match takes place in a controlled environment. All soccer players are faced with the same rules and restrictions. Thus, when investigating the connection between relative concern and performance, many factors can be controlled for.

It is useful to develop a composite index for individual performance. A widely used method is represented by equation (3). The basic idea is to add together all the ‘good things’ that a player does, such as points scored (*PTS*), total rebounds (*TREB*), steals (*STL*), blocks (*BLK*) and assists (*AST*), and then subtract the ‘bad things’, namely turnovers (*TO*), field goals missed (*FGMS*) and free throws missed (*FTMS*). Because less skilled players have relatively low salaries and play in fewer games, we divide the performance index by the number of games played.

$$PERF_{Basketball} = \frac{(PTS + TREB + STL + BLK + AST) - (TO + FGMS + FTMS)}{GP} \quad (3)$$

Although this proxy gives an in-depth picture of a player’s performance, it is not free of potential biases. For example, the equal weight can be criticized. However, even if it is not a perfect measurement of a player’s productivity, it provides a good indicator of changes in performance.

## Soccer

The rising commercialization of soccer led to better data sets. For example, in England, publicly listed clubs must publish their annual reports (Kern and Süßmuth 2003). In some cases (as in the case of the German *Bundesliga*), even salary data for individual players, or at least good proxies thereof, are available. This paper uses a unique data set of professional soccer players in the German premier soccer league *Bundesliga*<sup>4</sup>. IMP, the official data provider of the *Bundesliga*, and several broadcasting networks provided the data. This data includes soccer players’ individual performance and personal background data over a period of eight seasons between 1995/1996 and 2003/2004. During the eight seasons, 28 different clubs participated in the league due to annual promotion and relegation.

The *Bundesliga* is one of Europe’s ‘big five’ soccer leagues (for an overview, see Dobson and Goddard 2001). Interestingly, between 1995 and 2004, the *Bundesliga* consistently had the highest goals per game ratios of all five leagues. Dobson and Goddard (2001: 31) report that, in 1999, Germany was the most ‘cosmopolitan’ league, with only 58 percent of the players being

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<sup>3</sup> It was impossible to include 1997 in the soccer data set because player salary information was unavailable.

<sup>4</sup> Summary statistics are provided in *Table A2* in the Appendix.

German. For the 2000 season, the *Bundesliga*, (which has officially existed since 1902) had the highest average home attendances of all leagues.

The league structure is similar to that of other European leagues, but differs from US sports leagues in several key aspects (for a detailed overview, see Hoehn and Szymanski 1999). First, because the structure is open (meaning annual promotion and relegation), the teams compete in many hierarchical competitions simultaneously. Of the 18 teams that now make up the *Bundesliga*, three teams are relegated and promoted each season. Furthermore, in contrast to US sport markets that try to maintain a competitive balance between clubs through a rookie draft system, longer player contracts and salary caps, there is an active transfer market.

In the past, German clubs had the legal structure of a private social club (*Verein* is a non-profit organization), but some were also owned by industrial enterprises (e.g., Bayer Leverkusen). However, over the last few decades, more clubs have been commercialized; for instance, in the 2000/2001 season, Bayern Munich had a total revenue of around €150 million (Haas, Kocher and Sutter 2004). Clubs interact increasingly with financial markets. For example, in 1997, members of Borussia Dortmund voted to convert the club into a shareholding company (Hoehn and Szymanski 1999).

### ***Measuring Players' Pay***

Although the Bundesliga do not officially reveal the salaries of soccer professionals, there is substantial transparency. The most prominent soccer magazine in Germany, the *Kicker Sportmagazin*, develops players' market value estimates on an annual basis. They provide a good proxy for salaries actually being paid by the clubs<sup>5</sup>. Before a new season starts, the editorial staff develops an estimation of players' market values. This data has been collected in a consistent and systematic manner for several years by an almost identical editorial team, and is therefore likely to be consistent. To check the extent to which the market value estimations used in this paper correctly reflect actual salaries, the correlation between players' effective reported salaries, as provided by another data source called *Transfermarkt.de*, and our salary proxies is investigated. It may be argued that salary estimates are more precise for high-profile players and high-profile teams. This could lead to measurement errors. The *Transfermarkt.de* data has the advantage of

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<sup>5</sup> Information from the *Kicker Sportmagazin* has been used for empirical research studies in the past (see, for instance, Eschweiler and Vieth (2004), Hübl and Swieter (2002), Lehmann and Weigand (1998, 1999) and Lehmann and Schulze (2005)).



covering salary information for high- and low-profile players, as well as high- and low-profile teams. The correlation between these two data sources is high ( $r=0.754$ )<sup>6</sup>, so measurement errors do not seem to be a major problem. The empirical section will also indicate that the results obtained are robust when dealing with outliers. Moreover, the proxies for salaries are even more satisfactory when analyzing the relative position of soccer players compared to their teammates and their opponents. Our data set includes individual transfer prices, as well as earnings from ticket sales, merchandizing, and sponsoring revenues at the team level. We also look at the effect of future and past salaries on current performance.

### ***Measuring Players' Performance***

In line with previous sports papers and our basketball performance proxy, we develop a composite measure of performance (e.g., Harder 1992):

$$PERF_{Soccer} = \frac{GO + AS + DW - CF + OF}{GP} \quad (4)$$

with number of goals (GO), number of assists (AS), duels won (DW), and obtained fouls (OF) entering positively, and committed fouls (CF) entering negatively. We divide the resulting value by the number of games played (GP). The performance index allows us to take into account defensive and offensive aspects, as well as the level of successful and unsuccessful aggression. The index measures the active involvement and success per game.

### **Estimations and Controls**

Investigating the pay-for-performance relationship requires a model that takes the incentive effects of absolute and relative pay into account. Our model studies whether future pay affects a player's current performance. The model assumes that a player's current performance is not affected by the amount of money he or she has already earned. Rather, a major factor influencing current performance is future pay. Such a model is closely linked to the expectancy theory (see Harder 1992). Individual performance is motivated by what a player expects to receive in the

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<sup>6</sup> The publicly available data from *Transfermarkt.de* was only available for the season 2003/2004. Historical data was not available, as the Internet site had just started to collect this information in 2005. Furthermore, *Transfermarkt.de* covers a limited number of players in the German *Bundesliga*.

future. Such an expectation determines their present level of motivation and performance. As data on individual perceptions are not available, we assume that the best available proxy for individual perceptions is actual future pay. Thus, our specification has the following structure:

$$PERF_{it} = \beta_0 + \beta_1 CTRL_{it} + \beta_2 RELSAL_{i(t+1)} + \beta_4 ABSAL_{i(t+1)} + TD_t + \mu_i + \varepsilon_{it} \quad (5)$$

where  $PERF_{it}$  is the performance of player  $i$  at time  $t$ .  $RELSAL_{i(t+1)}$  is the future relative salary of player  $i$ , measured by the difference between teammates' average salaries and players' individual salaries<sup>7</sup>.  $ABSAL_{i(t+1)}$  is the future salary of a player. The regression also contains several control variables  $CTRL_{it}$  such as AGE, AGE SQUARED, and a player's position in the game. Similarly, the estimates include a set of time dummies ( $TD_t$ ) to control for possible differences in a player's environment;  $\mu_i$  is the individual effect of player  $i$ , and  $\varepsilon_{it}$  denotes the error term. We control for ability, since player fixed effects pick up any omitted variables (player characteristics) that do not change over time.

## EMPIRICAL RESULTS

We find considerable support that positional concerns and envy reduce individual performance. In contrast, there does not seem to be any tolerance for income disparity based on the hope that such differences signal that better times are under way. Positive behavioral consequences cannot be excluded for those who are enjoying better times due to the negative sign of our relative income variable.

*Table 1* presents the results reporting six specifications for basketball and six for soccer. Specifications (1), (2), (7) and (8) report the *beta* or *standardized* regression coefficients of an OLS regression with time fixed effects (seasons). The results reveal the relative importance of the variables used. To obtain robust standard errors in these estimations, the Huber/White/Sandwich estimators of standard errors are used. In specifications (3), (4), (9) and (10), the standard errors by players are clustered, since clustering picks up any player-specific characteristics that change

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<sup>7</sup> These are experts' estimations of players' salaries after the previous season. As mentioned previously, we check the robustness of the results, using the ratio, instead of the difference, to measure the relative income position.

over time. Using eight soccer and nine basketball seasons, ability can be taken to have a fixed and a variable portion. For example, a player's ability initially peaks and then declines prior to retirement, but throughout this cycle the player's ability stays above a player-specific threshold. Clustering allows us to control for the portion that changes over time. Such an effect is partly controlled by variable age. However, it makes sense to cluster the standard errors by player, since clustering will pick up any player-specific characteristics that change over time. Similarly, ability is controlled for by using fixed effects regressions in specifications (5), (6), (11) and (12). In addition, specifications with and without controlling player position in the game are presented. We don't report team fixed effects, as we want to go beyond a 'within team findings' focus.

[TABLE 1 about here]

The results in *Table 1* indicate that, if a player's salary is below the average, and this difference increases, his willingness to perform decreases and the negative effect of positional concerns is more visible. Thus, we find support that  $\beta_b < 0$ . The results are consistent with hypotheses 1 and 3. Theories, such as relative deprivation or envy, help to predict the impact of the relative income position on performance. On the other hand, hypotheses 2 and 4 are rejected. Income differences raise the incentive to achieve a similar status, or the ambition to improve the current status. There is no support that individuals are willing to give credit to and draw gratification and hope from the progress of others within their own organization. Due to the negative sign of the relative income variable, hypothesis 5 cannot be rejected. We cannot exclude that there is a positive impact of an above-average salary change towards a stronger difference in relation to teammates.

In sum, the results indicate that relative income position matters. The coefficient is highly statistically significant in all 12 regressions. In addition, the *beta* coefficient for the soccer data set even indicates that the relative income effect is stronger than the absolute income effect.

*Table 1* indicates that the coefficient of the absolute income variable is positive. However, the coefficient is only statistically significant in the first four regressions. The joint hypothesis, that the absolute and the relative income as a group have a coefficient that differs from zero, is clearly rejected. This result supports the importance of the income variables as a group.

Finally, the control variables show that age tends to influence performance, having a concave performance profile – that is, rising with age but decreasing as physical condition worsens.

## DISCUSSION

Behavioral evidence on the extent to which people within an organization care about their relative (economic) position is rare. As a novel approach, this paper reveals how such a position affects workers' performance, using sports data from two different disciplines, basketball and soccer. One of the main goals of the paper is to assess whether similar observations can be made in different team sports. Sports data allow us to hold many factors constant, as tournaments are very much like a controlled environment. The game takes place in a controlled environment. All players experience the same restrictions. External influences are controlled by the rules. Compared to other approaches, such as laboratory experiments, sports data have the advantage that the participation evokes actual and real processes in an environment outside a laboratory setting. Performing well has strong implications for professional basketball and soccer players. Laboratory experiments induce much lower economic or financial incentives than do actual sport tournaments.

### **Theoretical Implications**

We find support that envy and relative deprivation reduce individual performance in both sports disciplines. Players with a relative income disadvantage are more inclined to react by reducing their performance than by demonstrating ambition and motivation to improve their current situation and thus have a chance of keeping up with their teammate stars. If a player's salary is below average, and this difference increases, his willingness to perform decreases and the negative effect of positional concerns is more visible. Individuals are unwilling to give credit to and draw gratification from the progress of others and thereby overcome envy. At the same time, we cannot reject the hypothesis that above-average salaries lead to a positive performance. The strength of the theoretical part is to implement a model that allows the inclusion of several countervailing theories on how income differences influence performance. The model also goes beyond several previous models, assuming that performance within an organization is not only driven by absolute income, but also by relative position. In addition, our unique data sets, which

explore workers' pay and performance relationship in a controlled environment, offer the possibility of exploring several different theories on positional concerns. Working with sports data also avoids the problem of finding an adequate reference group.

### **Managerial Implications**

Our empirical results are cautiously transferable to business practices. Small firms seem to have the most similar setting to team sports (see Idson and Kahane 2000). However, the results may also apply to relatively independent departments or project teams in larger firms, in which positional concerns and envy are to be expected. Frank and Sunstein (2001) report evidence that perceptions of relative position have large effects on employee work morale. Similarly, Elster (1991) provides real life examples of envy-avoidance and envy-reduction mechanisms.

We find considerable support that positional concerns and envy reduce individual performance, and that there is no tolerance for income disparity overcoming envy and satisfying individuals who hope that better times are under way. These results are especially relevant for the design of merit pay programs. Positional concerns and envy are important in areas where measurable performance is directly linked to salary (pay-for-performance). In many sales driven organizations, it is common practice that variable pay makes up a large part of the total salary. For instance, insurance agents are paid according to their sales performance, measured by net new money, return on assets, and the number of policies sold. In addition, special rewards are given to the 'best seller' in a tournament setting. In order to stimulate internal competition among the sales force, and to push individual performance, transparency is increased by comparative performance rankings among the sales force. Since sales performance translates directly into personal income, these rankings show relative income positions. According to our empirical results, best seller rewards and incentive payments, based on sales performance ranking, inherently create inequity costs, as they create an outcome with asymmetric payoffs. Thus, they run the risk of diminishing, rather than improving, performance among those below the average. The best sellers, who dominate the rankings and earn much more than their colleagues, may cause feelings of envy and weaken the performance of the entire sales force if they cannot compensate for the loss incurred by envious salesmen whose performance is lowered. Although pay-for-performance schemes are helpful to identify low performers, they may tend to lower the average performance of the team.

As a result, there is obviously no one-size-fits-all approach to merit pay. When designing pay-for-performance mechanisms, firms need to consider the impact on below average performers and deal with the negative effects of positional concerns and envy. Sales people at the lower end of the ranking may observe that higher ranked colleagues are not performing better, but simply benefit from lucky punches or advantageous context factors (e.g., the districts they cover have a higher number of potential clients). Tailoring incentive schemes to the needs of different reference groups within an organization can hinder perceptions of inequality and prevent disruptive behavior. Furthermore, the distribution of rewards, the measurement process of underlying performance indicators and the pay administration procedures need to be perceived as fair (Cropanzano et al. 2007) in order to generate the most favorable effort outcomes of non-rewarded employees or below average performers. Additionally, pay-for-performance schemes should be complemented with process-oriented non-financial incentives, such as rewards for the best team player, best rookie, or most innovative team member of the year. This takes the individual need for social distinction into account, using a non-material extrinsic reward and avoiding the reinforcement of selfish extrinsic motivation, which crowds out intrinsic motivation (Frey and Osterloh 2005, Frey 2005).

### **Limitations and Future Research**

There are some limitations embedded in our research design. Using data from professional sports is in some ways unique. On average, the salaries paid in professional basketball and soccer are much higher than in most other occupations. In addition, the access to published salaries and clear performance measures limits the generalizability of our work, since the results might differ in situations in which pay and performance are less visible or less easily measured.

With sports data, we observe workers in a controlled environment driven by the same rules and similar conditions. Sports labor markets can therefore be seen as a laboratory for observing how incentives work. However, the question also arises here as to whether the results are transferable to a controlled environment.

A fruitful direction for future research would be further investigation of the degree to which positional concerns and envy reduce individual performance in team settings. Because of focusing on positional concerns and envy caused by relative income disparity, we did not look at the impact on organizational trust (Mayer and Gavin 2005, Schoorman et al. 2007) and

organizational justice (Cropanzano et al. 2007). It would also be innovative to combine performance variables with attitudinal questions to measure, for example, whether the salary is perceived as unfair, or whether and in what way strong workers feel envy or the need for distinction.

Despite the limitations mentioned, we hope that our study inspires other scholars to further explore the effects of positional concerns and envy on performance in organizations.

## APPENDIX A

Table A1: Summary Statistics Basketball

	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
POINTS SCORED	516.418	473.074	0	2491
TOTAL REBOUNDS	225.609	202.183	0	1201
STEALS	43.054	37.908	0	231
BLOCKS	27.506	38.599	0	332
ASSISTS	117.531	136.715	0	916
TURNOVERS	78.206	65.672	0	337
FIELD GOALS MISSED	238.598	208.423	0	1153
FREE THROWS MISSED	34.417	36.396	0	392
AGE	27.381	4.404	18	43
GAMES PLAYED	53.277	24.741	1	83
ABSOLUTESAL(t+1)	3.366	3.558	0.0067	33.1
RELATIVESAL(t+1)	-0.463	3.604	-30.99	7.35

Table A2: Summary Statistics Soccer

	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
GOALS	2.026	3.239	0.00	28.00
ASSISTS	2.002	2.576	0.00	19.00
DUELS WON	317.008	230.543	0.00	1236.00
COMMITTED FOULS	26.045	22.157	0.00	119.00
OBTAINED FOULS (BEING FOULED)	26.020	24.941	0.00	169.00
AGE	26.557	4.154	17.00	40.00
GAMES PLAYED	18.333	10.055	1.00	34.00
ABSOLUTESAL(t+1)	3.390	2.748	0.20	25.00
RELATIVESAL(t+1)	-0.035	2.434	-19.73	7.48



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TABLE 1

## The Effect of Positional Concerns in Basketball and Soccer

Dep. V.: Performance Index	BASKETBALL						SOCCER					
	OLS (beta coefficients)	OLS (beta coefficients)	Clustering on Players	Clustering on Players	FE	FE	OLS (beta coefficients)	OLS (beta coefficients)	Clustering on Players	Clustering on Players	FE	FE
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>SALARY</i>												
RELATIVESAL(t+1)	-0.247*** (-4.56)	-0.252*** (-4.66)	-0.406*** (-3.73)	-0.413*** (-3.82)	-0.231*** (-2.88)	-0.240*** (-3.00)	-0.448*** (-11.10)	-0.474*** (-11.85)	-0.630*** (-8.83)	-0.666*** (-9.75)	-0.589*** (-8.79)	-0.460*** (-8.83)
ABSOLUTESAL(t+1)	0.444*** (7.56)	0.443*** (7.52)	0.735*** (5.90)	0.733*** (5.84)	-0.024 -0.27	-0.033*** (-0.38)	0.027 (0.66)	0.034 (0.85)	0.034 (0.49)	0.043 (0.65)	-0.059 (-0.83)	0.079 (-0.85)
<i>PLAYER'S CHARACTERISTICS</i>												
AGE	-0.011 (-0.07)	-0.061 (-0.37)	-0.016 (-0.05)	-0.088 (-0.28)	4.457*** (15.20)	4.513*** (15.25)	0.751*** (3.30)	0.626*** (2.82)	0.660*** (2.42)	0.550*** (2.09)	1.444*** (3.95)	2.144*** (3.91)
AGE SQ	-0.030 (-0.18)	0.024 (0.14)	-0.001 (-0.14)	0.001 (0.11)	-0.085*** (-16.76)	-0.086** (-16.70)	-0.674*** (-2.98)	-0.567** (-2.56)	-0.011** (-2.15)	-0.009* (-1.87)	-0.024*** (-4.41)	-0.013*** (-4.42)
POSITION	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
SEASON	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLAYER	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
F-Test joint significance (REL. & ABOLUTE SAL.)	557.22***	553.09***	278.70***	278.19***	24.98***	25.37***	175.98***	187.21***	113.51***	127.25***	114.77***	115.78***
R-Squared	0.448	0.457	0.448	0.457	0.230	0.236	0.243	0.271	0.243	0.271	0.200	0.205
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Groups (Players)	699	699	699	699	699	699	768	768	768	768	768	768
Number of Observations	2807	2807	2807	2807	2807	2807	2143	2143	2143	2143	2143	2143

Notes: \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level. *t*-statistics in parentheses.

