Do Employees Care About Their Relative Income Position? Behavioral Evidence Focusing on Performance in Professional Team Sport*

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Objective. Do employees care about their relative (economic) position in comparison to their co-workers in an organization? And if so, does it raise or lower their performance? While the topic is widely discussed in the literature, behavioral evidence on these important questions is relatively rare. *Methods.* This article explores the pay-performance relationship using a sports data set. The strength of analyzing such data is that sports tournaments take place in a very controlled environment that helps to isolate a relative income effect. *Results.* Using two large unique data sets that cover 26 seasons in basketball and eight seasons in soccer (Bundesliga), we find considerable support for the idea that a relative income disadvantage is correlated with a decrease in individual performance. In addition, there does not seem to be any tolerance for income disparity based on the hope that such differences may signal that better times are ahead. *Conclusions.* This suggests the need to consider the impact of the relative income position when designing pay-for-performance mechanisms within firms and teams.

It is often said that calm can only be maintained in organizations by keeping peoples' salaries secret (Layard, 2003). In China, model workers spend their

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bonuses on treating their work colleagues to a good meal in order to avoid harassment by those same workmates (Elster, 1991). Bacon (1890) writes in his *Essays or Counsels, Civil and Moral* that "[m]en 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" (1890:57). Schoeck (1966) reports several homicides committed by people overwhelmed by feelings of envy. In addition, leading historical figures such as Smith (1759), Marx (1849), Veblen (1899), and Duesenberry (1949) have long emphasized the importance of the relative position and social concerns. The pay structure in organizations has important behavioral consequences in work organizations (Harder, 1992).

Despite these historical discussions on the consequences of relative position, the standard social science literature has paid little attention to the topic. 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" (2004: 47). A plausible explanation for the lack of evidence is that the study of relative income position is layered with pitfalls. The first apparent problem in the study of the impact of relative income position is the lack of empirical evidence to support the claims laid out by the theoretical literature.

The main contribution of this study is to provide some answers to the question: How do people react in a real work environment to an increasing difference in income? Do they perform better or worse? This is explored within a competitive environment where employees (who are part of a team) experience increasing income differences. It has been shown that competitive settings encourage social comparison, may foster interpersonal distrust or hostility, and the structure of reward system affects emotions such as envy (Gillman, 1996; Vecchio, 1999, 2000, 2005). In a work environment where individuals are perceived to be similar, yet are competing on the basis of performance, the likelihood of social comparisons and envy increases (Salovey and Rodin, 1991; Tesser, 1991; Vecchio, 2005).

We are able to circumvent many of the problems involved with studying the relative income position by using unique sport data sets from American basketball (NBA) and German soccer (Bundesliga). Using sports data has several advantages compared to other data sources. The data have low variable errors. Performance is clearly observable and is free of discrepancies, compared to other frequently used performance variables, such as self-reported effort. 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, hence many factors can be controlled for when investigating the connection between relative concern and performance. The job profile is similar and social comparisons are likely to happen. In addition, transparent salary information is available. Although it is not possible to study alternative commercial settings in the same way, we argue that the evidence

obtained here is relevant for employees in corporations as the majority work in teams, which to some extent are like sports teams.

The following section will go into more detail on the background of the relative income position, bringing together various strains of literature. The next two sections provide the theoretical background and the hypotheses. Afterwards, we present the empirical results and the last section finishes with implications and some concluding remarks on study limitations and future research.

Considerations on Relative Income Position

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 the absolute level of an individual's situation is important (e.g., pay), but also the relative position.

With income as a reference variable, some researchers have used hypothetical questions regarding choice between alternative states or outcomes, where the choices allow for checking out relative positional concerns (Frank, 1985; Zeckhauser, 1991; Tversky and Griffin, 1991; Solnick and Hemenway, 1998; Frank and Sunstein, 2001). The results show that a large proportion of people (sometimes even more than half) usually prefer the setting with the better relative standing to the setting of better absolute standing.

Positional Concerns and Emotional Reactions

The relative income situation may induce emotions; however, we are unable to measure emotions directly with our relative income variable. Employers' or employees' perception of their relative position has a considerable effect on their morale (Frank and Sunstein, 2001). An individual's self-esteem at work plays a significant role in determining his or her work motivation and commitment, job satisfaction, turnover intentions, and work-related attitudes and behaviors (Pierce and Gardner, 2004). Relative income position has been related to envy (Kirchsteiger, 1994; Dunn and Schweitzer, 2004; Fischer and Torgler, forthcoming; Schmidt, Torgler, and Frey, 2009). Envy plays a crucial role through social comparisons (Miceli and Castelfranchi, 2007) involving "feedback that is threatening to self-evaluation in a self-defining (or relevant) domain" (Salovey, 1991:280). Various studies have explored envy and jealousy in the workplace. For example, Dogan and Vecchio (2001) stress that behaviors resulting from envious and jealous emotions are often dysfunctional in nature and induce direct (time and energy expended by the resentful employees) and indirect costs (unpleasant consequences such as retaliation, loss of reputation, emotional costs of possible discipline). The authors also stress the "loss in employee performance that may result from a desire to restore fairness in

the situation" (2001:60). Envy 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). Smith (1991:78, 82) points out the importance of understanding hostile envy as such feelings have the potential to hamper social interaction, to create unhappiness, to compromise health, and to handicap human excellence (1991:96). Ben-Ze'ev (1992) also stresses that a "subject's inferiority is a central concern in envy" (1992:581); exploring in detail the link between envy and inequality as envy covers the desire to eliminate inequality. Several years ago, Foster (1972) discussed the anatomy of envy. More recently, Smith and Kim (2007) and Miceli and Castelfranchi (2007) provide useful overviews that show the current status of the literature. It is important to note that we employ a definition of envy that leaves open if these feelings are triggered by perceived unfairness, competitive feelings, or admiration (see Cohen-Charash, 2009 for a detailed discussion how these concepts are related).

Selection of Reference Group

If people compare themselves with other individuals, then the key question is: Who is the reference group? In his *Rhetoric* (book II, chapter 10), Aristotle stresses that envy is felt only toward those people who are our equals or our peers. Similarly, Francis Bacon writes in his *Essays or Counsels, Civil and Moral* that proximity defines 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" (1954:121). Similarly, soldiers in World War II seem to have made comparisons primarily with members of their own military group (Stouffer, 1949). Workers within the same organizations have an inclination to compare themselves with co-workers. In our context, soccer and basketball players, as in other team sports, compare themselves with their teammates. This provides a strong argument for the comparative advantage of working with sports data.

Closeness is often referred to as a situation where a group of individuals are seen to be in a unit relation (Heider, 1958; Pleban and Tesser, 1981), such as being teammates. It has also been noted that the feeling of inequality is a function of psychological and perceived closeness (Pritchard, 1969). Campbell's (1978) results suggest that situational and work-related dimensions are much more critical than psychological closeness. Schaffner and Torgler (2008) find empirical support that closeness is correlated with a higher level of positional concerns. Moreover, it has been argued that people are more likely to compare themselves with others who are slightly upward of their actual position (for example, skill, capability, success) than with objectively similar individuals (Micheli and Castelfranchi, 2007).

Theoretical Model and Hypotheses

Model

There are several countervailing theories regarding how income differences influence performance. 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. Equation (1) shows the general structure of the performance function P of a worker i:

$$p_i = P(A(y_i), R(y_i, \vec{y})). \tag{1}$$

Individual performance p_i in such a model is ceteris paribus a function of own income y_i and own income in relation to the income of the entire set of workers y. The function $A(y_i)$ captures the impact of the absolute income. The influence of the relative income position on performance is described by the function $R(y_i, \vec{y})$. We assume that relative income or social comparison is a function of the difference in income as detailed in Equation (2). 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 relative 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.

$$R(y_i, \vec{y}) = \beta \left(\sum_{j \neq i} y_j \Big/ (n-1) - y_i \right) \tag{2}$$

The sign of $(\sum_{j \neq i} y_j/(n-1) - y_i)$ indicates whether the worker i experiences a relative disadvantage (positive) or a relative advantage (negative) in relation to the selected reference group with n members within an organization (e.g., teammates). The term measures the difference between the average income of the reference group and individual's income. The coefficient β is a weighting variable denoting the impact of the relative position. In the following paragraphs, several hypotheses are formed, which are subsequently tested in the empirical part of the article.

Hypotheses

Positional Concerns and Behavior. The theory of social comparison (see Festinger, 1954) and the theory of relative deprivation (Stouffer, 1949) suggest that comparisons with others are an important phenomenon. Relative deprivation theory investigates interpersonal and intergroup relations and

comparisons. 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 (Turley, 2002). 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 toward 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 Walker and Pettigrew, 1984).

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). Such behavior has been found in laboratory experiments, such as ultimatum games (see 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). Cohen-Charash and Mueller (2007:666; see also Duffy and Shaw, 2000) point out that "most research has shown that behavioral reactions to envy involve harming the other person." The performance of those with lower income may decrease due to frustration ("it *could* have or *should* have been me"). This might be particularly relevant in team sports. Smith and Kim (2007:52) refer to social exchange theory[1] to suggest that if employees receive fewer resources from the organization than they think their performance deserves, perceived unfairness leads them to engage in behaviors aimed at restoring fairness. This might be achieved through harming the organization, the supervisor, a peer, or, in particular, the envied person (Cohen-Charash and Mueller, 2007). As a consequence, performance is lowered. Inequality can lead to workplace sabotage (Ambrose, Seabright, and Schminke, 2002), employee theft (Greenberg, 1988; Greenberg and Scott, 1996), or stress symptoms (Cropanzano, Bowen, and Gilliland, 2007). Harming reduces the envious person's frustration with feeling inferior, reduces the envy-provoking advantage the envied person has, and empowers and helps compensate for the envious person's feeling of inadequacy and wounded self-esteem (Cohen-Charash and Mueller, 2007:666–67). Miceli and Castelfranchi (2007) argue that any disadvantage between two people can be reduced through acquisition of the desired good, or by forcing the advantaged party to lose the good: "The latter option is viewed as more plausible than the former by the envier if he has acknowledged his own helplessness with regard to acquiring the good or achieving the goal in question" (2007:452). Masterson et al. (2000) point out that social exchange relationships provide a mechanism that helps to explain how perceived fairness of single events can even have long-term effects within organizations.

[1]For an interdisciplinary overview of the social exchange theory, see Cropanzano and Mitchell (2005).

Similarly, not being able to keep up with their co-workers may lead to frustration, resignation, and even shame. Such workers 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. People dislike being in a lower income position because the relative position may signal that they and their future prospects are evaluated poorly by others. Such perceptions and signals harm their relationship with others, and affect their self-conception and performance (Kräkel, 2000).

In sum, the following hypothesis refers to the behavioral consequences of relative deprivation and disadvantageous inequality. It proposes a negative motivational effect on performance for the workers affected.

Hypothesis 1: *A relative income disadvantage leads to a reduction in performance ($\beta < 0$).*

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, Rebitzer, and Taylor, 1996; Schaubroeck and Lam, 1994). 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, while indicating that there is potential to emulate the stars within an organization. Better-paid colleagues serve as models of success. This leads to an opposite hypothesis:

Hypothesis 2: *A relative income disadvantage leads to an increase in performance ($\beta > 0$).*

Waiting for Better Times. 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 or positional concerns. 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 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" (1973:545). Thus, Hirschman (1973) refers to *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. 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 can be dominated by a positive information effect. Senik (2008) finds support for the idea that the reference income provides a source of information rather than a ground for comparison in posttransition 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 same.

Hypothesis 2: *A decrease in the relative income position leads to an increase in individual performance ($\beta > 0$).*

Method and Empirical Results

This article uses a unique data set of professional basketball and soccer players. Empirical studies of the effects of income differences on managerial and work behavior have been hindered by the lack of (comparable) 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 are drawn from the most prestigious American basketball league, namely, the National Basketball Association (NBA).[2] There are 29 teams in the NBA, divided into two conferences (Eastern and Western). 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 information such as players' salaries. A large proportion of the data has been collected from the website usatoday.com. Additional sources were used to cover 26 seasons between 1979 and 2006. The data set covers not only the contract salary, but also additional salary components, such as bonuses.

Measuring Players' Performance. It is useful to develop a composite index for individual performance. Berri and Krautmann (2006) compare a number of different performance measurements. By examining the effect of the different performance measurements on the winning percentage, they

[2]Summary statistics are provided in Table A1 in the Appendix.

come up with the formula given in Equation (3). A simplified evaluation of this measure reveals that in addition to the number of points scored, it adds up all the events that lead to a change in possession of the ball, where total rebounds (*TREB*) and steals (*STL*) increase the player's rating and turnovers (*TO*) decrease it. Field goal attempts (*FGA*) and fraction 44 percent of free throw attempts (*FTA*) are subtracted as well, to reflect the change of possession involved with these events. Note that this setup implies that a successful field goal results in 2 or 3 additional *PTS*, but only increases the performance score by 1 or 2, since that attempt is subtracted. Because individual performance is driven by the chance of playing we divide the performance index by the number of games played.

$$PERF_{\text{basketball}} = (PTS - FGA - 0.44 \times FTA + TREB + STL - TO)/GP. \tag{3}$$

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

To further validate the results this article also uses a data set of professional soccer players in the German premier soccer league *Bundesliga*[3] obtained from the official data provider of the *Bundesliga* and several broadcasting networks. These data include soccer players' individual performance and personal background data over a period of eight seasons between 1995/1996 and 2003/2004.[4] 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. Of the 18 teams that now make up the *Bundesliga*, three teams are relegated and promoted each season.

Measuring Players' Pay. Although the *Bundesliga* does 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. It provides a good proxy for salaries actually being paid by the clubs.[5] Before a new season starts,

[3]Summary statistics are provided in Table A2 in the Appendix.

[4]It was impossible to include 1997 in the soccer data set because player salary information was unavailable.

[5]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; Lehmann and Schulze, 2008; Torgler and Schmidt, 2007).

the editorial staff develops an estimation of players' market values. These data have been collected in a consistent and systematic manner for several years by an almost identical editorial team, and are therefore likely to be reliable. To check the extent to which the market value estimations used in this article 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 have the advantage of 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 ($r = 0.754$),[6] 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, we develop a simple composite measure of performance (e.g., Harder, 1992) that is similar to the one used for the basketball analysis:

$$PERF_{\text{soccer}} = (GO + AS + DW - CF + OF)/GP, \tag{4}$$

with number of goals (GO), number of assists (AS), duels won (DW), and obtained fouls (OF) entering positively, and committed fouls (CF) entering negatively. Again 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. Unfortunately, an analysis of performance indicators on winning percentage is less conclusive in soccer than in basketball. Thus, we also check each *single* determinant separately. It is important to note that results are in line with the findings that will be presented using the composite index. Lucifora and Simmons (2003) find that the individual performance measurements have different impacts for different positions; thus we also explore individuals' position in the game separately. For example, goals and assists may be more relevant for attackers and midfield players, but less for defense players. On the other hand, defenders commit more fouls.

[6]The publicly available data from *Transfermarkt.de* were only available for the season 2003/2004. Historical data were 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*.

Estimations and Controls

We are going to explore several different models, including one that takes into account only the present relative income situation (5) and another model that focuses on the current and future relative income situation (6), using the mean value. The advantage of using such a variety of time periods is that it takes into account the fact that players are affected by more than simply the amount of money that has already been paid out. In other words, individuals' behavior is not only driven by the current situation but also by the *anticipated* situation. A recent literature stresses the relevance of incorporating anticipation in the common utility framework (Frederick, Loewenstein, and O'Donoghue, 2003). Our proxy may also cover possible expectations that determine the present level of motivation and performance.

$$\text{Model1}: \quad PERF_{it} = \alpha + \beta_1 RELSAL_{it} + \gamma_1 ABSAL_{it} + \gamma_2 CTRL + TD_t + \mu_i + \varepsilon_{it}, \tag{5}$$

$$\text{Model2}: \quad PERF_{it} = \alpha + \beta_2 RELSAL_{i(t,t+1)} + \gamma_1 ABSAL_{it} + \gamma_2 CTRL + TD_t + \mu_i + \varepsilon_{it}, \tag{6}$$

where $PERF_{it}$ is the performance of player i at time t. *RELSAL* is the relative salary of player i, measured by the difference between teammates' average salaries and players' individual salaries.[7] *ABSAL* is the current salary of a player. The regression also contains several control variables (*CTRL*) such as *AGE*, *AGE SQUARED* (*SQ*), 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; μ_i is the individual effect of player i, and ε_{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.

To check the robustness of the results we will also present further models using performance in the prior year as a control variable to better measure change, and past salaries to deal with the criticism that the causal nature of the association between income and performance might be problematic.

Empirical Results

Table 1 presents the results reporting 12 specifications for basketball. The first six specifications focus on Model 1, the second set on Model 2. Specifications (1), (4), (7), and (10) report the *beta* or *standardized* regression coefficients of an OLS regression with time fixed effects (seasons). The

[7]In the case of the soccer data these are experts' estimations of players' salaries after the previous season. We check the robustness of the results, using the ratio, instead of the difference, to measure the relative income position.

TABLE 1

The Effect of Positional Concerns in Basketball (Season 1976–2006)

	Model 1						Model 2					
Independent Variables	OLS (Beta Coefficient) (1)	Clustering on Players (2)	FE (3)	OLS (Beta Coefficient) (4)	Clustering on Players (5)	FE (6)	OLS (Beta Coefficient) (7)	Clustering on Players (8)	FE (9)	OLS (Beta Coefficient) (10)	Clustering on Players (11)	FE (12)
Salary												
RELSAL	−0.376***	−0.369***	−0.117***	−0.366***	−0.359***	−0.117***	−0.521***	−0.545***	−0.207***	−0.493***	−0.515***	−0.207***
	(−17.29)	(−15.57)	(−8.55)	(−19.54)	(−17.55)	(−8.55)	(−16.27)	(−13.33)	(−8.82)	(−16.95)	(−13.96)	(−8.82)
ABSAL	0.080**	0.079**	−0.068***	0.058**	0.057*	−0.068***	−0.114**	−0.112**	−0.166***	−0.117***	−0.114**	−0.166***
	(3.12)	(2.86)	(−4.14)	(2.58)	(2.32)	(−4.14)	(−3.11)	(−2.71)	(−6.81)	(−3.50)	(−2.99)	(−6.81)
CTRL												
AGE	0.245*	0.188	1.875***	0.540***	0.415**	1.875***	0.340**	0.26	1.880***	0.636***	0.487***	1.880***
	(1.98)	(1.33)	(20.99)	(4.61)	(3.12)	(20.99)	(2.78)	(1.88)	(20.38)	(5.49)	(3.72)	(20.38)
AGE SQ	−0.212	−0.003	−0.036***	−0.508***	−0.007**	−0.036***	−0.313*	−0.004	−0.037***	−0.611***	−0.008***	−0.037***
	(−1.71)	(−1.12)	(−24.68)	(−4.35)	(−2.88)	(−24.68)	(−2.57)	(−1.70)	(−25.07)	(−5.30)	(−3.52)	(−25.07)
Position	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Season	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Player	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
F-test joint significance relative and absolute salary	484.46***	170.67***	37.08***	566.13***	242.24***	37.08***	501.10***	164.87***	39.44***	565.77***	222.47***	39.44***
R-squared	0.214	0.214	0.207	0.366	0.366	0.207	0.207	0.207	0.206	0.356	0.356	0.206
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)		1183	1183		1183	1183		1181	1181		1181	1181
Number of observations	5844	5844	5844	5844	5844	5844	5806	5806	5806	5806	5806	5806

NOTES: Dependent Variable: Performance Index. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent level. *t*-statistics in parentheses.

results reveal the relative importance of the variables. To obtain robust standard errors in these estimations, the Huber/White/Sandwich estimators of standard errors are used. In specifications (2), (5), (8), and (11), the standard errors by players are clustered, since clustering picks up any player-specific characteristics that change over time. 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 also partly controlled by the 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 (3), (6), (9), and (12). In addition, specifications with and without controlling for the player's position in the game are presented. We do not report team fixed effects as we want to go beyond a "within team findings" focus.

We find considerable support for the proposition that disadvantageous inequality reduces individual performance. The coefficient for relative salary (*RELSAL*) is highly statistically significant with a negative sign ($\beta < 0$) in all 12 regressions. 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. This result is consistent with Hypothesis 1, but not Hypothesis 2. Theories such as relative deprivation or positional concerns help to predict the impact of the relative income position on performance. On the other hand, an income disadvantage does not raise the incentive to achieve a similar status. There is also no evidence that individuals are willing to give credit to and draw gratification and hope from the progress of others within their own organization. In sum, the results show that relative income position matters. The joint hypothesis, that the absolute (*ABSAL*) and the relative income (*RELSAL*) as a group have a coefficient that differs from zero, is also clearly rejected. This finding supports the importance of the income variables as a group. However, the *beta* coefficient indicates that the relative income effect is stronger than the absolute income effect. Finally, we also observe the tendency that age tends to influence performance, having a concave performance profile—that is, rising with age but decreasing as physical condition worsens.

In Table 2, we report the findings using the soccer data set. Here, we also observe that the coefficient on *RELSAL* is always statistically significant with a negative sign. For simplicity we only report the results using Model 1; however, the findings are comparable when using Model 2. The coefficient is always statistically significant at the 1 percent level, reporting the largest quantitative effect of all the independent variables. The first six regressions are in line with those reported in Table 1 when basketball was the focus. Table 2 shows that the coefficient on *RELSAL* is also statistically significant with a negative sign. Thus an increase in the disadvantageous inequality reduces individual performance. Thus, we again find support for Hypothesis 1.

TABLE 2

The Effect of Positional Concerns in Soccer

	Model 1, Dependent Variable: Performance Index						Model 1, Dependent Variable: Goals + Assists Players: Attacker, Midfield Players					
Independent Variables	OLS (Beta Coeffi-cient) (13)	Clust-ering on Players (14)	FE (15)	OLS (Beta Coeffi-cient.) (16)	Clust-ering on Players (17)	FE (18)	OLS (Beta Coeffi-cient) (19)	Clust-ering on Players (20)	FE (21)	OLS (Beta Coeffi-cient) (22)	Clust-ering on Players (23)	FE (24)
Salary												
RELSAL	−0.283***	−0.466***	−0.676***	−0.318***	−0.523***	−0.681***	−0.258***	−0.678***	−0.732***	−0.226***	−0.594***	−0.736***
	(−8.91)	(−7.32)	(−10.07)	(−10.24)	(−8.81)	(−10.19)	(−6.94)	(−6.40)	(−5.27)	(−6.25)	(−6.01)	(−5.29)
ABSAL	0.093**	0.127*	−0.468***	0.096**	0.132*	−0.469***	0.274***	0.597***	−0.590***	0.276***	0.602***	−0.592***
	(2.89)	(2.17)	(−6.97)	(3.10)	(2.41)	(−7.03)	(7.12)	(5.88)	(−4.27)	(7.48)	(6.70)	(−4.29)
CTRL												
AGE	0.673**	0.586*	2.158***	0.513*	0.446	2.166***	0.475*	0.687	3.436***	0.504*	0.729*	3.427***
	(3.09)	(2.38)	(6.35)	(2.39)	(1.87)	(6.40)	(2.35)	(1.91)	(5.16)	(2.56)	(2.18)	(5.15)
AGE SQ	−0.701**	−0.011*	−0.039***	−0.562**	−0.009*	−0.039***	−0.444*	−0.012	−0.067***	−0.460*	−0.012	−0.067***
	(−3.24)	(−2.48)	(−8.35)	(−2.65)	(−2.06)	(−8.45)	(−2.18)	(−1.73)	(−6.69)	(−2.33)	(−1.94)	(−6.68)
Position	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Season	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Player	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
F-test joint significance relative and absolute salary	142.07***	88.48***	53.07***	157.37***	105.88***	54.43***	128.48***	101.66***	13.89***	126.80***	115.12***	14.03***
R-squared	0.144	0.144	0.143	0.178	0.178	0.153	0.266	0.266	0.115	0.305	0.305	0.116
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)		1040	1040		1040	1040		778	778		778	778
Number of observations	2783	2783	2783	2783	2783	2783	1932	1932	1932	1932	1932	1932

NOTES: *,**, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent level. *t*-statistics in parentheses.

To check the robustness of these results we present in Table 2 six further specifications (19–24) using an alternative performance index (namely, goals and assists) and focusing only on attackers and midfield players. As this performance variable measures offense success, it makes sense not to consider defense players. Again, the results indicate that the coefficient on *RELSAL* is statistically significant with a negative sign. Thus, using an alternative performance proxy and focusing only on attackers and midfield players does not change the previous results.

In addition, we checked whether lagged income variables have an impact on performance. We first conducted estimations using only lagged values of the key independent variable, namely, relative income. Results indicate that *RELSAL* is statistically significant in all estimations, and exploring a lagged *ABSAL* variable does not change that result. In addition, we extended these estimations, controlling for performance in the prior year in order to better measure change. In most of the estimations, the coefficient is positive and statistically significant at the 1 percent level. The R^2 strongly increases (e.g., to 0.7 in the OLS). Our *RELSAL* variable is also statistically significant at the 1 percent level, and reports a negative sign in all 12 estimations when focusing on both basketball and soccer.

Conclusions

There is little behavioral evidence on the extent to which people care about their relative (economic) position within an organization. In a novel approach, this article uses sports data from two different disciplines (basketball and soccer) to reveal how the relative position affects employees' performance. One of the main goals of this article is to assess whether similar observations can be made in various team sports. Sports data allow us to hold many factors constant. The game takes place in a controlled environment, all players experience the same restrictions, and other external influences are controlled by the rules.

We find support for the proposition that disadvantageous inequality reduces 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 teammates. Our fixed effects (FE) estimations also indicate that 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. The theoretical part implements a model that allows the inclusion of several countervailing theories regarding 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 the relative position. In addition, our unique data sets, which explore employees' pay and

performance relationship in a controlled environment, offer the possibility of exploring several theories on positional concerns. Positional concerns are important in areas where measurable performance is directly linked to salary (pay-for-performance).

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. When designing pay-for-performance mechanisms firms may need to consider the impact on below-average performers and deal with the negative effects of positional concerns and envy. Tailoring incentive schemes to the needs of different reference groups and the culture within an organization (see Mannix, Neale, and Northcraft, 1995) can reduce 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; Menon and Thompson, 2007) in order to generate the most favorable effort outcomes of nonrewarded employees or below-average performers. Additionally, pay-for-performance schemes should be complemented with process-oriented nonfinancial 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 nonmaterial extrinsic reward and avoiding the reinforcement of selfish extrinsic motivation, which crowds out intrinsic motivation (Frey and Osterloh, 2005; Frey, 2005).

There are some limitations embedded in our research design. 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. The question also arises here as to whether the results are transferable to a less controlled environment. Another inherent limitation of the analysis is that we did not work with a direct measure of envy. Envy may influence the results, but is treated as a black box in this study. Thus, the exact role of envy, unfairness, relative deprivation, inferiority, frustration, or any other competing variable cannot be directly inferred from this study. In general, Miceli and Castelfranchi (2007:467) point out that "it is very difficult to empirically assess the existence of a true 'sense of injustice' (however subjective) in envy." Future studies could try to take a closer look at players' reactions in the field such as facial expressions or transcripts of interviews that could give evidence of "sour grapes" remarks, perceived inequality, or other indicators of emotion. Furthermore, we did not explore whether there is a positive impact of an above-average salary change toward a stronger difference in relation to teammates. Due to the negative sign of the relative income variable such an effect cannot be excluded.

A fruitful direction for future research would also be to further investigate the degree to which positional concerns reduce individual performance in team settings. Due to our focus on positional concerns caused by relative income disparity, we did not look at the impact on organizational trust (Mayer and Gavin, 2005; Schoorman, Mayer, and Davis, 2007) and organizational justice (Cropanzano et al., 2007). It would also be interesting 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.

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Appendix

TABLE A1

Summary Statistics Basketball

	Mean	*SD*	Minimum	Maximum
Points scored	597.840	512.323	0	3041
Total rebounds	250.962	218.91	0	1530
Steals	47.914	41.129	0	301
Blocks	30.307	41.927	0	456
Assists	136.339	151.429	0	1164
Turnovers	89.367	70.181	0	350
Field goals missed	228.442	194.630	0	1098
Free throws missed	118.791	117.107	0	833
Age	26.965	4.031	18	43
Games played	57.392	24.038	1	83
Absolute salary	2.100	2.981	0.001	33.124
Relative salary ($t + 1$, t)	0.016	2.849	−29.049	9.481

TABLE A2

Summary Statistics Soccer

	Mean	*SD*	Minimum	Maximum
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	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
Absolute salary	2.867	2.553	0.05	25.00
Relative salary ($t + 1$, t)	0.004	2.233	−12.882	6.555