Celebrity Misbehavior

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December 7, 2004

Misbehavior by high-profile individuals is an important element in the government, media, and entertainment fields. I discuss seven theories of misbehavior by these individuals, including one new theory, based on the labor elasticity of substitution. In this theory, workers who are relatively less substitutable are more difficult to fire, so they are able to misbehave at greater levels than other workers. I show that lack of substitutability is a natural element in most celebrity labor outputs. This theory, and the others, are then tested using data from an important class of celebrities, professional basketball players. I find that substitutability plays an important role in determining misbehavior, but that income effects, immaturity, and exogenous personal character matter, too.

* Special thanks to Gary Becker, Tim Perri, Allen Sanderson, Curtis Simon, and Robert Tamura, as well as seminar participants at Appalachian State and Clemson for suggestions and comments. All errors are, however, my own. Comments welcome at tkendal@clemson.edu.

I. Introduction

Famous people are often social "leaders", where trends and fads in thought and behavior begin. Hence, they are of special interest to social scientists. Despite intense interest in fame and celebrity in other fields, surprisingly little economic analysis on the topic has been performed.[1] One prominent feature of celebrity is their seemingly high propensity to engage in socially unapproved behavior. Anecdotal evidence for such a propensity is, of course, widely reported. A more careful analysis by Fowles (1992) finds strong evidence for this view, showing that celebrities have shorter life spans than non-celebrities, particularly due to increased risks of accident, suicide, among other "lifestyle"-related factors.[2] Further, opinion surveys such as Lichter et al (1983) and Prindle (1990) have documented extreme political and social opinions[3] among stars.

In this paper, I compare and contrast some theories of celebrity misbehavior, arguing that the phenomenon has many causes, and that there is an important, but heretofore neglected "economic" theory of celebrity misbehavior.

Specifically, the product provided by celebrities is often so intrinsically tied to the celebrity himself that it cannot be consumed without him. For instance, the demand for a recording of the song "Yesterday", originally performed by the Beatles, is many orders of magnitude greater than the demand for the same song, as recorded by a Beatles "cover" band,

[1] Prominently, Cowen (2000) addresses several areas in the economics of fame, Landes and Posner (2000) explore the distribution of fame among legal scholars, and Rosen (1981) discusses the labor market for "superstars", of which famous people are a subset.

[2] Death rates due to cirrhosis, kidney failure, ulcers and homicide are also higher among celebrities than in the general population, though celebrities have lower death rates from ailments which are typically ameliorable with high wealth levels, including heart disease and stroke. Goertzel, et al (1978) find that celebrity authors have especially high risk of suicide, marital problems and sexual deviance, compared to other notable persons. Redelmeier and Singh (2001a and 2001b) debate whether success at the margin decreases celebrity mortality.

[3] For instance, Lichter et al (1983) find that 51% of elite Hollywood producers disagree with the statement "Adultery is wrong".

even a very talented one. To paraphrase Marshall McLuhan, "the [celebrity] is the message".

Thus, the nature of the production process for celebrity output generates an inability of consumers to substitute their consumption away from prominent celebrities. This relative inelasticity in the demand for a celebrity's output means that misbehavior does not lower the demand for their labor as much as misbehavior by non-celebrity workers would. In short, celebrities can get away with misbehavior because the market cannot easily replace them.

In Section IV below, I test various theories of celebrity misbehavior on an important class of celebrity, professional basketball players. Basketball players are highly prominent in society, and an easily measurable form of misbehavior exists for them: their propensity to receive "technical" fouls and to be ejected from games. I show that this measure of misbehavior on the court seems to be highly correlated with misbehavior off the court, and I find that a number of factors influence misbehavior, including prominently this substitutability effect, but also income effects, immaturity, and personal character. Publicity does not seem to drive much misbehavior.

Naturally, understanding the causes of misbehavior is important for non-celebrity workers, as well, and a significant amount of economic research has addressed misbehavior generally.[4] Looking at the particularly stark case of celebrities may also add to the understanding of non-celebrity misbehavior. For instance, the demand for janitorial services within firms is likely to be more elastic than the demand for computer assistance services, since working in a dirty environment or cleaning up one's own workspace constitute relatively low-cost alternatives to janitorial services, while most

[4] Becker and Stigler (1974) and Lazear (1990) suggest that deferred compensation contracts reduce employee misbehavior; Shapiro and Stiglitz (1984) suggest that efficiency wages can reduce employee shirking; Laband and Lentz (1998), Antecol and Cobb-Clark (2003), and Basu (2001) treat the economics of sexual harassment in the workplace; Garcia (1996) considers factors that influence drug usage on the job.

people cannot fix their own computers. The theory presented in this paper suggests that janitors should be friendlier and more diligent than IT professionals, which certainly fits the stereotype of these two professions[5]. Higher misbehavior rates among tenured than among non-tenured university faculty would also be a prediction of the model, one that has some justification in survey data by List (2001).

II. Factors Influencing Misbehavior among Celebrities

There are a number of reasons why celebrities might engage in more misbehavior than non-celebrities. In this section, I briefly consider six essentially "non-economic" theories of celebrity misbehavior, without producing formal models. I make no claim that this list constitutes a complete theory of celebrity behavior, but I mention them here since I can address each of them in some way empirically in section IV.

(1) *The "Beautiful Mind" theory*. In his brief autobiography after sharing the Nobel Prize in Economic Sciences in 1994, John Nash discussed his struggle with mental illness thus:

> …at the present time I seem to be thinking rationally again in the style that is characteristic of scientists. However this is not entirely a matter of joy as if someone returned from physical disability to good physical health. **One aspect of this is that rationality of thought imposes a limit on a person's concept of his relation to the cosmos.** For example, a non-Zoroastrian could think of Zarathustra as simply a madman who led millions of naive followers to adopt a cult of ritual fire worship. But without his "madness" Zarathustra would necessarily have been only another of the millions or billions of human individuals who have lived and then been forgotten. **[emphasis added]**

Nash seems to imply that there is some exogenous, possibly genetic, factor that leads

[5] In its discussion of IT professionals in the US economy, a government report states, "[A] lack of social skills contributed to their public reputation as 'nerds', 'geeks', 'bit heads', 'propeller-heads', and the like" (Commerce Department, 2003).

individuals to be creative, "outside-the-box" thinkers, both in their employment and in their personal preferences. If so, then the brilliant ideas and performances that make one a celebrity would be more likely to originate from people who also have preferences considered outside of social norms.

(2) *Income effects*. It is possible that misbehavior is simply a normal good, so that celebrities, who generally rank among the highest paid workers in the economy, lose less utility from the fall in demand for their services associated with bad behavior. Alternatively but equivalently, high-earners may be able to hire better legal counsel and publicity representatives after misbehaving, lowering their effective price of bad behavior. Under these income effects theories, however, one would expect CEO's of Fortune 500 corporations to engage in as much or more illicit drug use, marital infidelity, and public oafishness as movie stars and rock stars. I know of no empirical work on this subject that addresses this question, though the casual view is certainly that they do not.

(3) *The "all publicity is good publicity" theory*. Misbehavior may be a means by which celebrities draw greater attention to their work. After her ignominious rise to celebrity, Monica Lewinsky was able to start a line of fashionable women's accessories (The Real Monica, Inc.). Janet Jackson's widely condemned bodice-ripping during the 2004 Super Bowl halftime show surely increased the sales of her album, which was released shortly afterwards. Moreover, fans may enjoy living vicariously through the exploits of their favorite celebrities, increasing the demand for those celebrities' products. Certainly there is an element of recklessness and sexual machismo that attracts teenage boys to demand the performances of rock stars and hip-hop artists with long rap sheets.

(4) *Peer Effects*. High-profile movie stars, athletes, and musicians may be pestered or

even mobbed by fans asking for autographs and other favors when they make public appearances. For this reason, celebrities employ professional assistants to do their grocery shopping and other tasks that non-celebrities typically would do themselves. This leads celebrities to engage in a disproportionate number of social interactions with other celebrities. Such a tight-knit group may lead to the rise of different social norms than arise among non-celebrities, who interact frequently with persons from a variety of walks of life.[6]

(5) *Youthful Immaturity*. Many celebrities – especially movie stars and musicians – are valued by audiences at least partially by their attractiveness. For this reason, and also because teenagers constitute a significant source of demand for celebrity output, celebrities themselves tend to be young. Young people sometimes lack the life experiences that would temper their behavior, and may misunderstand the potential consequences of bad behavior, leading them to engage in activities towards which a more mature worker would be less inclined.

(6) *Stress*. Celebrities often live under very stressful circumstances, both because of the nature of the production process for entertainment services, and because of the constant focus of the public eye upon them (see Walls and Cooper, 1988). Such stressful conditions may lead to psychologically-driven outbursts of anti-social behavior, as when a rock star assaults a camera-wielding paparazzi at his home, or a movie star engages in marital infidelity after spending two months filming on location far from home.

III. An Economic Theory of Celebrity Misbehavior.

While the six reasons discussed above may – and in some cases indubitably are –

[6] Becker and Murphy (2000) suggest that peer effects can explain different norms in speech patterns among teenagers and the different social norms regarding smoking that exist in Japan and the U.S.

important in determining the level of anti-social behavior among celebrities, in this section, I outline a formal model of another effect, which the empirical evidence in Section IV suggests is also important. The model is one of a generic firm that employs workers of two types. Firms discipline workers by reducing their demand for misbehaving workers – either through cutting back on their hours or by firing anti-social workers. Firms that can more easily substitute between the two types of workers can thus more credibly discipline badly behaving workers, which reduces the supply of misbehavior among workers. Thus, the result of the model is that workers who are less substitutable in the production process engage in more bad behavior.

Celebrity labor may be less substitutable than non-celebrity labor for several reasons. Most celebrities have very rare talents, and are for that very reason difficult to replace. Moreover, unlike the conventional model of consumer behavior, consumers of celebrity outputs care not only about the quantity of the output they receive, but also the technology by which the product was created. For instance, the demand for "Terminator" movies would likely fall precipitously if another actor other than Arnold Schwarzenegger – even one who was an equally talented actor and bodybuilder – were cast into the role for a future sequel. Similarly, the demand for the song "Billie Jean" practically *is* the demand for Michael Jackson's labor services, and most fans of the Chicago Bulls do not simply root for the franchise to win, but also care about the particular players who *are* the Bulls.

I treat first the labor demand side of the market, then move to labor supply. Throughout, I rely on specific functional forms for simplicity; a more general analysis is available upon request from the author.

Labor Demand

Firms produce output by combining the labor inputs of two different types of workers in a CES functional form:

$$Y = \left[a_1 L_1^{\rho} + a_2 L_2^{\rho} \right]^{\frac{\lambda}{\rho}}$$

where $\rho < 1$ indicates the level of substitutability in the production process between the two worker types. a_i denotes the productivity of worker type *i*, and λ denotes the returns to scale.

Workers may choose to engage in some counterproductive activity, which I will refer to as "misbehavior", but which might also encompass other counterproductive activities, such as office gossip, etc. Denote the level of misbehavior worker type *i* engages in by x_i.

The productivity of type-*i* workers falls as their level of misbehavior increases.[7] Thus, let the a_i coefficients be decreasing functions of x_i:

$$a_i = a_i(x_i) \qquad \text{where} \quad \frac{da_i}{dx_i} < 0 \ \text{ and } \ \frac{d^2 a_i}{dx_i^2} > 0$$

How should firms react to misbehavior on the part of their employees? It is possible that a firm could simply monitor employees' activities closely and impose fines for each infraction equal to the value of the output lost because of that infraction. In such a case, the employee would internalize the entire cost of misbehavior, and the firm would have little interest in trying to regulate their employees' behavior.

[7] Alternatively, we could have allowed misbehavior by type *i* to affect the productivity of type *j* workers; the same results would follow so long as misbehavior reduces own-type productivity more than other-type productivity.

Casual empiricism suggests that this is not how firms deal with badly behaved employees. Most firms closely monitor employee behavior, and misbehavior is dealt with by cutting back on an employee's privileges while at work, or by threats to fire the employee. There are a number of reasons for such a response, as discussed in the large literature on monitoring (Dickens et al, 1989): in some cases, firms may be unable to accurately measure the marginal cost of anti-social behavior; in other cases, such as workplace violence, the costs may exceed the total discounted present value of the worker's future earnings; legal restrictions on contracts and social limits on enforceability may reduce the ability of firms to effectively fine employees. Moreover, it may be difficult to prove a case against an employee in court, such that the employer finds it easier to reduce the employee's hours or reassign the employee instead of directly cutting his wages.

In this paper, I will consider the extreme case, in which a firm's entire response to bad behavior by a particular worker is to reduce that worker's hours. However, to the extent that firms can respond to misbehavior by appropriately fining workers, the results of the model below will be proportionately mitigated.

Thus, assume that each worker type has a fixed exogenously-determined wage, w_i. Then the firm's profit maximization problem can be written as:

$$\max_{L_1, L_2} \left[a_1(x_1) L_1^{\rho} + a_2(x_2) L_2^{\rho} \right]^{\frac{\lambda}{\rho}} - w_1 L_1 - w_2 L_2$$

The first order conditions from this problem are:

$$FOC[L_1]: \quad \lambda\left[a_1(x_1)L_1^{\rho} + a_2(x_2)L_2^{\rho}\right]^{\frac{\lambda-\rho}{\rho}} a_1(x_1)L_1^{\rho} = w_1 L_1$$

$$FOC[L_2]: \quad \lambda\left[a_1(x_1)L_1^{\rho} + a_2(x_2)L_2^{\rho}\right]^{\frac{\lambda-\rho}{\rho}} a_2(x_2)L_2^{\rho} = w_2 L_2$$

Dividing FOC[L_1] into FOC[L_2] implies:

$$\frac{L_2}{L_1} = \left[\frac{a_1(x_1)}{a_2(x_2)}\frac{w_2}{w_1}\right]^{\frac{1}{\rho-1}}$$

From this equation, note two facts. First, the relative demand for type-*i* labor has an inverse relationship with type-*i* misbehavior, such that

[1] $$\frac{dL_i}{dx_i} < 0$$

for any constant level of output. Second, note also that L_i and ρ have an inverse relationship if and only if $a_i(x_i)w_{\sim i} < a_{\sim i}(x_{\sim i})w_i$. Thus, the larger is x_i, the more likely is the relationship between L_i and ρ to be an inverse one. In other words (again for a constant level of output),

[2] $$\frac{d^2 L_i}{dx_i d\rho} < 0$$

Labor Supply

Now I turn to the problem faced by workers supplying labor to the firm. I assume that misbehavior entails positive psychological value for workers, allowing them to, for instance, vent frustration or feel superior to their co-workers.

For simplicity, I will assume a linear form for the utility function, although the results would still hold generally under the conditions of a more general utility function.[8] Thus, assume that worker type-*i* has the following utility function:

$$U_i = \alpha(w_i L_i) + \beta x_i$$

α and β represent the worker's subjective marginal valuations of labor income and misbehavior respectively, and it is assumed that α and β are both positive.

Each type of worker maximizes his utility function by choosing his level of misbehavior, x_i. The first-order condition is given by:

[3] $$\alpha w_i \frac{dL_i}{dx_i} + \beta = 0$$

Note that the second-order condition for the worker's problem to be convex is:

[4] $$\frac{d^2 L_i}{dx_i^2} < 0$$

[8] In a more general analysis (available upon request), I include a labor-leisure tradeoff in workers' utility, which allows wages to be determined endogenously, but does not generally affect the results of the comparative statics exercise below.

Performing a comparative statics exercise, we may allow ρ to vary, and see the effect on the worker's choice of x_i. In other words, we may ask what happens to a worker's incentive to engage in bad behavior when the production process becomes more substitutable in his labor input.

Thus, take the derivative of equation [3] with respect to ρ:

$$\alpha w_i \left[\frac{d^2 L_i}{dx_i^2} \frac{dx_i}{d\rho} + \frac{d^2 L_i}{dx_i d\rho} \right] = 0$$

This derivation implies that:

$$\frac{dx_i}{d\rho} = -\left[\frac{\frac{d^2 L_i}{dx_i d\rho}}{\frac{d^2 L_i}{dx_i^2}} \right]$$

The numerator of the expression on the right-hand side was found to be negative by equation [2], and the denominator was found to be negative by equation [4].

Thus, the more substitutable a worker type is in the production process, the less misbehavior he will engage in: $\frac{dx_i}{d\rho} < 0$.

IV. Empirical Application

1. Introduction

In this section, I consider a measurable form of misbehavior among an important

class of celebrities, professional basketball players. Michael Jordan, Yao Ming, Shaquille O'Neal, and many others are instantly recognizable faces to many. The mean salary for NBA players during the sample period I consider below is $2.6 million[9], a number comparable to the salaries paid to top movie stars, musical artists, novelists, and politicians. *Forbes* magazine ranked eight NBA players among their annual list of the 100 "most powerful" celebrities in 1999 (the median year for the analysis below), including the #1 spot, which was held by Michael Jordan.[10]

I choose to focus on NBA players, to the exclusion of other celebrities, because there are easily observable measures of misbehavior among basketball players. In particular, I examine the propensity of players to commit technical fouls and to be ejected from games.[11] I argue below that this measure of on-court misbehavior is highly correlated with off-court misbehavior, which provides some confidence for generalizing the results here to other classes of celebrity.

2. Rules governing technical fouls and ejections

According to the Official Rules of the NBA, technical fouls may be assigned to individual players by referees during the play of a basketball game for four possible reasons: (1) excessive time-outs; (2) excessive delay-of-game; (3) illegal substitutions (for instance, inserting a player into a game without notifying the scorer's table); and (4) unsportsmanlike

[9] Although the median salary is only $1.6 million, signifying a highly skewed distribution.
[10] These 8 had average earnings (including all shoe and other promotional contracts) of $21.25 million, while the average salary over all 100 celebrities on the list that year was $33.93 million. The highest earning NBA player, Michael Jordan, earned $69 million in 1999, comparable to the $65 earned by top-earning author Michael Crichton, the $77 million earned by top-earning actor Tim Allen, and the $56 million earned by top-earning singer Celine Dion.
[11] McCormick and Tollison (1984) also consider basketball players' propensity to commit fouls, though they focus on personal fouls, not technical fouls. Heckelman and Yates (2003) perform a similar study on hockey violence.

conduct, including hanging on the basketball rim excessively, fighting with other players or officials, disrespectfully addressing an official, overt actions indicating resentment to a call, use of profanity, taunting, deliberately-thrown elbows or fists, and any attempted physical assault without contact.

Of these four types of infractions, technical fouls are only very rarely called for any of the first three. Almost all personal technical fouls indicate unsportsmanlike conduct.

In addition, players are automatically ejected upon receiving two technical fouls during the same game. Moreover, they can also be ejected immediately for fighting, punching or attempting to punch, elbowing above the shoulders, throwing the ball at anyone, or entering the stands to argue or fight with spectators.

The penalty for technical fouls varies. For a single offense, such as disrespectfully addressing an official, the opposing team receives an opportunity to take a free throw. For fights and other situations where technical fouls are called simultaneously on both teams, no free throws are awarded, although the ejection of players may be involved[12].

Moreover, an unsportsmanlike technical foul involves an automatic $500 penalty to the player committing the foul, and an automatic ejection-worthy offense carries a penalty of at least $1,000, and may also involve a suspension from some number of future games. The Commissioner of the NBA determines the level of penalty in such cases. The median fine for ejection in recent years has been $5,000. The *longest* suspensions levied are around 5 games, although in a few exceptional cases they have been much longer[13]. The median

[12] In addition, for excessive time-out situations, the ball changes possession, and for delay-of-game situations, additional time may be added to the shot clock. The ball does not change possession for other types of technical fouls.

[13] The only suspensions in league history greater than 10 games are (1) Ron Artest, Stephen Jackson, and Jermaine O'Neal (Indiana Pacers) were suspended for 73, 30 and 25 games, respectively, for fighting with fans during a game, (2) Latrell Sprewell (Golden State Warriors) was suspended for 68 games during the 1997-98 season for assaulting his coach, (3) Kermit Washington (Los Angeles Lakers) was suspended for

suspension is 1 game. Individual teams and coaches may also assess additional fines and penalties at their own discretion.

3. Are technical fouls and ejections a meaningful measure of misbehavior?

One may ask whether technical fouls and ejections, representing misbehavior on the court, are correlated with general misbehavior *off* the court. Table 1 provides a list of the "worst on-court offenders" – those accumulating the most technical fouls per 1000 minutes played and ejections per 82 games – during the sample years. Most of these players have had very turbulent off-court careers. For instance, Rasheed Wallace has been arrested on drug charges and once physically threatened an NBA official outside the stadium. Anthony Mason has been charged with statutory rape, attacking a police officer, and assault on two occasions. Charles Barkley, whose autobiography is entitled "Outrageous", has joked on-camera about violence towards women, and has been involved in a number of bar fights, including one where he threw a man into a glass window. Dennis Rodman, whose autobiography is entitled "Bad As I Wanna Be", has been arrested for DUI, spousal abuse, and public drunkenness, and was very briefly married to Carmen Electra. Vin Baker has also publicly struggled with alcoholism, and Derrick Coleman has faced criminal charges for two DUIs as well as for public urination in the dining room of an Italian restaurant. Shawn Kemp is banned from the NBA for life due to repeatedly failing drug tests.

Admittedly, a few players on this list, such as Shawn Bradley and Jerome Kersey, have exhibited mostly nondescript off-court behavior, so the relationship between on-court and off-court misbehavior is not a perfect one.

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26 games in 1977 for punching (and nearly killing) another player, Rudy Tomjanovich, and (4) Dennis Rodman (Chicago Bulls) was suspended for 11 games in 1997 for kicking a courtside TV photographer.

In addition, I also collected the number of arrests or other misbehavior incidents for each player from a popular website tallying misbehavior among athletes, *cracksmoker.com*. The number of arrests listed on the website for a player is positively and significantly correlated with the average number of technical fouls per minute played players in my sample received ($\rho = 0.30$, significant at the <1% level).[14]

4. Testing theories of celebrity misbehavior

I propose to use these data to test some of the theories discussed in Sections II and III above. Some summary statistics on the sample are provided in Table 2.

First, consider the **"all publicity is good publicity"** theory – that players may use technical fouls and ejections to gain fame or popularity with fans. In Table 3, I consider the effect of a player's misbehavior, as proxied by technical fouling or ejections, on his election to the NBA All-Star game. Participation in the All-Star game is determined by fan voting[15] and so should be a reasonable measure of a player's popularity with fans (see Hanssen and Anderson, 1999 for a similar application to professional baseball's all-star game). The functional form of these regressions is probit, and the results in Table 2 are the marginal effects at the mean values of the right-hand side variables, with standard errors robust to clustering at the player level. Most of the productivity statistics are significant and of the expected sign, with the number of points a player scores as the most important determinant of all-star election. However, neither technical fouls nor ejections seem to have a significant

[14] I could have simply used *cracksmoker.com*'s lists as the data for the paper, but public reporting of arrests is strongly correlated with a player's infamy, generating bias in the results.
[15] Also, a vote of NBA coaches is involved in selecting non-starting members of the All-Star team. Exclusion of non-starting players did not affect the results in Table 2 significantly.

and independent effect on a player's election to the all-star game.[16]

While election to the all-star game is only one measure of a player's popularity, and indicates national popularity, not only hometown popularity, the fact that players with higher misbehavior rates do not seem any more likely to appear in the all-star game suggests that the "publicity" factor in technical fouling and ejections is likely to be small.

This hypothesis is relevant to the interpretation of the results in Table 4, where I seek evidence about the **"substitutability"** theory of misbehavior outlined in Section III. I consider three measures of a player's substitutability on his team: a) his ordinal ranking in the salary distribution on his team (with "1" denoting the highest paid player); b) the number of years he has played with the same franchise; and c) the share of his team's total payroll represented in his salary.

In column [1] I run a simple cross-sectional regression using the "salary rank" measure of substitutability. I also include the player's raw salary, so that the salary rank variable is separate from any **income effect**, and some control variables, including the player's position, his body mass index[17], seasonal fixed effects (coefficients not reported), and a measure of his aggressiveness on the court, flagrant fouls.[18] All regressions are weighted by minutes played, and standard errors are robust to clustering at the player level.

Thus, the coefficients on the salary rank variables in column [1] imply that, for two players with identical salaries, one who is the top paid on his team will commit roughly 0.17 more technical fouls per 1000 minutes than one who is the second-highest paid on his team.

[16] More general functional forms, including adding quadratic terms in technical fouling or ejections did not change the results.
[17] BMI = body weight in kg, divided by (height in meters)^2. Including height and weight separately does not affect the results.
[18] Players can receive flagrant fouls for what referees perceive as unnecessarily physical, but not malicious, play.

Since the mean number of technical fouls committed per season is only 2.36, and a "star" typically plays 2500-3000 minutes per seaseon, this represents an economically significant increase – a nearly 20% increase in bad behavior from moving up in the team salary distribution by one rank.

In column [2], I perform the same analysis, but including player fixed effects. I do not include the positional and BMI variables in the fixed effects regressions since these variables rarely change over a player's career.[19] The result in column [2] suggests that when the same player moves from a team where he is the second best-paid player to a team where he is the best-paid player, his technical fouling rate will increase by 0.11 per 1000 minutes. This is a smaller effect than derived in the cross-section, but still statistically significant.

If a player's salary rank is an appropriate measure of how substitutable his talents are, then columns [1] and [2] support the **substitutability** theory presented in section III. On the other hand, these results are also consistent with the **"stress"** theory – that the top players on a team misbehave more because they are under greater media and fan scrutiny.

Figure [1] displays the relationship between salary rank and technical fouling even more explicitly, presenting the results of a regression similar to than in column [2], but allowing the "salary rank" variable to enter non-parametrically. The same inverse relationship is even more obvious here than in the regression results, although there are some deviations from trend, particularly between the 8th and 12th ranked players.

Column [1] in Table 4 also finds a significant and independent effect of salary on a player's technical fouling rate, suggesting some role for either **income effects** or the **"publicity"** hypothesis discussed in Section II. Given the results of Table 3 on All-Star game participation, suggesting little or no publicity effect, the significant coefficient on

[19] And when they do, it is more often due to measurement error than an actual change.

salary in column [1] would likely be due to **income effects**. The fact that the salary variable becomes insignificant in column [2] when player fixed effects are included suggests that either sorting issues are driving the coefficient on salary in column [1] or, more feasibly, that players make their misbehavior decisions based on their "permanent" income, not on transitory changes in income.

In columns [3] and [4] I continue with the fixed effects specification, but use different proxies for player substitutability. In column [3], the number of seasons with the same franchise may reasonably suggest how intrinsically associated a player is with his team. Again, the results support **the substitutability theory** – a player behaves worse the longer he has been with his team. And this result holds despite the obvious bias in the estimation due to the fact that more poorly behaved players tend to be traded more often due to altercations with coaches and other players.

This proxy for substitutability also allows some separation of the **substitutability** theory from the **"stress"** theory. Players who are the top paid on their team may be less substitutable and under greater stress, but players who have played more years with the same franchise are not necessarily under greater stress.

Column [4] addresses the **substitutability** theory with a measure similar to salary rank, a player's salary share of the total team payroll. Again, including the raw salary as a covariate separates the **substitutability** theory from **income effects** or other theories. The results further support the theory that a player who becomes less substitutable behaves worse.

One alternative hypothesis to explain the results in columns [1] – [4] is that, due to the fixed time for a game (ignoring overtime), there is a roughly fixed number of plays in each game. Thus, while it is clear that better paid players generally touch the ball more

often, there is also a rank distribution of "touches" on any given team, with the highest paid player on a team being involved in more plays independently of his absolute salary level. If a player's salary rank or share of the team payroll is independently correlated with the number of times he touches the ball, and touching the ball more leads to more fights and other unruly behavior, then this might explain the results presented so far.

First, however, note that a player's years with the same franchise would not necessarily be affected by this bias. Furthermore, note the results in column [5], which run the same fixed effects regression as column [2], but include a measure of the player's involvement in the game, his "touches" per 1000 minutes. I count a player to touch the ball if he is credited with a field goal, rebound, or assist. The results in column [5] suggest that, indeed, players who touch the ball more often do commit more technical fouls, but that the salary rank variable is still independently significant.[20] This suggests that it is truly **substitutability** that is driving the results, not a spurious correlation with a player's level of involvement in the game.

Finally, one may note how the coefficient of determination (R^2) increases from 15% to 68% between columns [1] and [2] in Table 4. While economic variables such as substitutability and income may be important in determining a player's level of misbehavior, over half of the variance in misbehavior is due to player characteristics which are either inherent, or at least determined before entry into the NBA. This suggests that the **"beautiful mind"** theory discussed in Section II may be highly relevant to understanding celebrity misbehavior.

In Table 5, I address two of the other theories from Section II that I have not

[20] This result is robust to inclusion of a quadratic term, and to inclusion of the three components of "touches" separately.

mentioned so far. The first two columns of Table 5 consider the "**youthful immaturity**" theory – that younger players may engage in more misbehavior. This theory has been especially popular in the sports press (e.g. Redeker, 2000) as players increasingly enter the NBA at younger ages, and in lieu of college attendance. Column [1] is a simple cross-section just like column [1] in Table 4, but includes a quadratic function of the player's age. The results suggest that misbehavior declines convexly as a player ages, reaching a minimum at age 26, after when it begins to climb again. This suggests some support for the immaturity theory, though the fact that behavior worsens after age 26 suggests that there may be more subtle elements to the story.

Contrast these results to those derived from the same regression, but including player fixed effects, displayed in column [2]. For a given player, it seems that misbehavior actually *increases* with age, peaking at age 30, and then declining. Comparing the results from columns [1] and [2], it seems that badly behaved young players have shorter careers, perhaps because bad behavior is correlated with other factors such as an unwillingness to stay in top condition as one ages or perhaps drug use that may diminish future productivity. However, long-lasting players actually behave worse as they grow older, a fact which is also consistent, though not exclusively so, with the **substitutability** theory, since older players are likely to be more compelling to fans who have followed their careers for many years.

Column [3] of Table 5 addresses the **"peer effects"** theory of misbehavior, as discussed in Section II. Column [3] estimates the same regression as column [2], but now includes the technical fouling rate of other players on the same team. The results suggest that when a player's teammates behave worse, the player himself behaves worse. This suggests some support for the **peer effects** theory; however, it is not entirely compelling, since player

sorting into teams is not truly exogenous. For instance, effects such as having a lax coach might drive all players on the same team to misbehave more in a particular year. While Kendall (2003) argues that such effects are likely small, it is impossible to completely separate out the **peer effects** theory here from other factors leading to positive sorting.

V. Conclusion

This paper has considered an under-researched problem in economics, worker misbehavior, by looking at an interesting and important case: that of celebrities. Although there are many reasons why celebrities might engage in a disproportionately large amount of bad behavior, the empirical evidence above suggests a significant role for labor substitutability in the production process. Workers who are sufficiently unsubstitutable can "get away" with more misbehavior simply because their employers' options are so limited.

In light of Andy Warhol's famous comment suggesting that in the future, everyone will be famous for 15 minutes, the substitutability hypothesis presented in this paper suggests a decline in celebrity misbehavior over time. In other words, as publicity technology improves and costs fall (as seen in "reality television", internet journalism, etc.), celebrities become more easily substitutable and the propensity to misbehave falls. On the other hand, a fall in the costs of publicity might induce more "all publicity is good publicity"-style misbehavior.

Table 1: Worst Offenders in Sample

Player	Season	Technical Fouls per 1000 Minutes Played
Rasheed Wallace	2000-01	13.61
Rasheed Wallace	1999-00	13.36
Dennis Rodman	1996-97	12.84
Bimbo Coles	2000-01	11.19
Gary Payton	1998-99	10.95
Charles Barkley	1996-97	10.95
Chris Gatling	2000-01	10.78
Vin Baker	2002-03	10.62
Shawn Bradley	2003-04	10.35
Charles Barkley	1997-98	10.25

Player	Season	Ejections per 82 games played
Rasheed Wallace	2000-01	7.45
Rasheed Wallace	1999-00	7.09
Charles Barkley	1997-98	6.03
Shaquille O'Neal	2001-02	4.89
Anthony Mason	1996-97	4.49
Dennis Rodman	1996-97	4.47
Jerome Kersey	1997-98	4.43
Chris Gatling	2000-01	4.43
Derrick Coleman	1997-98	4.16
Shawn Kemp	1999-00	4.00
Gary Payton	2003-04	4.00

Table 2: Summary Statistics

Variable	Mean	S.D.	Max
Technical fouls per season (actual)	2.36	3.69	40
Tech. fouls per 1000 minutes played (rate)	1.54	2.93	90.1
Ejections per season (actual)	0.19	0.53	7
Ejections per 82 games played (rate)	0.24	0.83	20.5
Salary (millions)	2.94	3.41	33.1
Minutes played	1236.3	946.31	3485
Games played	51.81	25.65	82
Age	27.81	4.47	43.17
Height (inches)	79.16	3.77	91
Weight (lbs)	223.56	29.54	343
Years with same franchise			
Flagrant fouls per 1000 minutes (rate)	0.29	1.29	38.46
Position = Center	0.19		
Position = Guard	0.39		
Position = Forward	0.39		
Position = Undefined	0.01		

Note: the "actual" rates for technical fouls and ejections use only the four sample years in which a full 82 game season was played. There was a work stoppage in the 1998-99 season, such that only 50 games were played that year.

Table 3: Does Misbehavior Improve a Player's Popularity?

Dependent Variable: Election to All-Star Team

	[1]	[2]
Technical Fouls	-1.2×10^{-5} (0.25)	
Ejections		-7.4×10^{-5} (0.26)
Points (in 100's)	0.001 (7.20)	0.001 (7.26)
Games	-1.4×10^{-4} (3.66)	-1.4×10^{-4} (3.68)
Center	0.004 (1.68)	0.004 (1.68)
Guard	0.005 (2.81)	0.005 (2.81)
Height	5.1×10^{-4} (2.49)	5.1×10^{-4} (2.50)
Weight	4.1×10^{-5} (1.80)	4.1×10^{-5} (1.79)
Age	0.002 (1.68)	0.002 (1.69)
Age^2	-3.0×10^{-5} (1.57)	-2.9×10^{-5} (1.58)
Offensive Rebounds (in 100's)	0.001 (1.46)	0.001 (1.45)
Defensive Rebounds	0.002 (3.92)	0.002 (3.91)
Assists	8.1×10^{-6} (2.00)	8.1×10^{-6} (2.02)
Blocks	1.8×10^{-5} (1.93)	1.8×10^{-5} (1.94)
Turnovers	-1.4×10^{-6} (0.12)	-1.3×10^{-6} (0.11)
Steals	1.7×10^{-5} (1.35)	1.7×10^{-5} (1.35)
Personal Fouls	-3.3×10^{-5} (3.15)	-3.3×10^{-5} (3.15)
Flagrant Fouls	2.1×10^{-4} (0.41)	2.2×10^{-4} (0.43)
Pseudo R^2	0.62	0.62
N	3021	3021

Notes: These are the marginal effects at the mean from a probit regression of election to the NBA All-Star Game on player productivity statistics, and proxies for misbehavior. Standard errors are robust to clustering at the player level. The 1998-99 season is not included, since there was no 1999 All-star game due to a league lock-out.

Table 4: "Substitutability" Theory of Misbehavior

Dependent Variable: Technical Fouls Committed Per 1000 Minutes Played

	[1]	[2]	[3]	[4]	[5]
Salary rank on team (1=highest)	-0.20* (3.84)	-0.11* (2.62)			-0.07* (1.84)
Salary rank^2	0.01* (3.85)	0.004* (1.87)			0.002 (1.03)
Years with same franchise			0.04* (2.17)		
Share of team payroll				0.02* (1.63)	
Log (salary)	0.32* (2.66)	-0.02 (0.20)	0.13* (2.12)	0.01 (0.15)	-0.05 (0.59)
Position = center	0.05 (0.25)				
Position = guard	-0.50* (3.08)				
Body mass index	0.04 (0.89)				
Flagrant fouls per 1000 minutes	0.74* (7.80)	0.24* (3.00)	0.23* (2.96)	0.24* (3.03)	0.24* (3.13)
"Touches" per 1000 minutes					0.003* (4.50)
Player Fixed Effects?	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Constant	-3.41* (1.82)	2.12 (1.46)	-0.10 (0.11)	1.51 (1.14)	1.00 (0.64)
R^2	0.15	0.68	0.68	0.68	0.69
N	3376	3376	3376	3376	3376

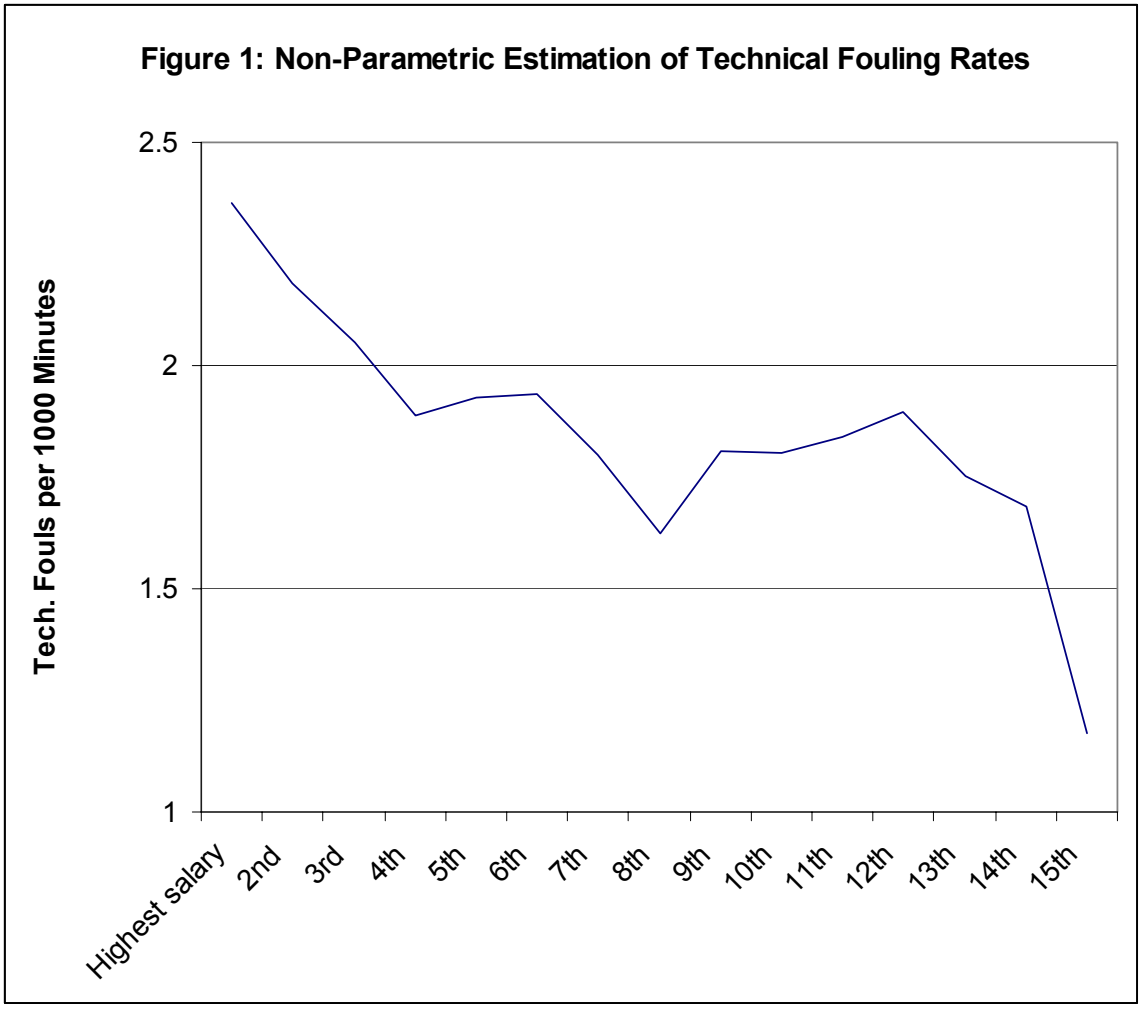
Notes – t-statistics in parentheses. * indicates significance at better than 10% level. All regressions are weighted by minutes played, and standard errors are robust to clustering by player. "Touches" are the sum of field goal attempts, assists, and rebounds.

Table 5: Other Factors Influencing Misbehavior

Dependent Variable: Tech. Fouls Per 1000 Minutes Played

	[1]	[2]	[3]
Salary rank on team (1=highest)	-0.21* (3.97)	-0.08* (2.09)	-0.08* (2.32)
Salary rank^2	0.01* (3.94)	0.003 (1.18)	0.003 (1.35)
Log (salary)	0.29* (2.34)	-0.13 (1.35)	-0.14 (1.42)
Position = center	0.03 (0.15)		
Position = guard	-0.49* (3.05)		
Body mass index	0.04 (0.92)		
Flagrant fouls per 1000 minutes	0.73* (7.96)	0.23* (2.97)	0.23 (2.97)
Age	-0.26 (1.68)	0.60 (3.11)	0.59 (3.01)
Age^2	0.005 (1.76)	-0.01 (3.94)	-0.01 (3.77)
Age Jointly Signif.?	No	Yes*	Yes*
Teammates' tech foul rate			0.14 (2.67)
Player Fixed Effects?	**No**	**Yes**	**Yes**
Year Fixed Effects	Yes	Yes	Yes
Constant	0.36 (0.14)	-4.27 (0.97)	-4.13 (0.94)
R^2	0.16	0.69	0.69
N	3376	3376	3376

Notes – t-statistics in parentheses. * indicates significance at better than 10% level. All regressions are weighted by minutes played, and standard errors are robust to clustering by player.



Note: The figure displays the results of a linear regression with player-level fixed effects, similar to column [2] in Table 4, but allowing the "salary rank" variable to enter non-parametrically instead of quadratically. The points graphed are the predicted values of the left-hand side variable at the mean values of the right-hand side variables, other than salary rank.