

Robin Hood Under the Hood: Wealth-Based Discrimination in Illicit Customer Help

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This paper investigates whether an employee's perception of customer wealth affects his likelihood of engaging in illegal behavior. We propose that envy and empathy lead employees to discriminate in illicitly helping customers based on customer wealth. We test for this hypothesis in the vehicle emissions testing market, where employees have the opportunity to illegally help customers by passing vehicles that would otherwise fail emissions tests. We find that for a significant number of inspectors, leniency is much higher for those customers with standard vehicles than for those with luxury cars, although a smaller group appears to favor wealthy drivers. We also investigate the psychological mechanisms explaining this wealth-based discriminatory behavior using a laboratory study. Our experiment shows that individuals are more willing to illegally help peers when those peers drive standard rather than luxury cars, and that envy and empathy mediate this effect. Collectively, our results suggest the presence of wealth-based discrimination in employee–customer relations and that envy toward wealthy customers and empathy toward those of similar economic status drive much of this illegal behavior. Implications for both theory and practice are discussed.

Key words: unethical behavior; empathy; envy; fraud; Robin Hood; wealth-based discrimination

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Both the popular press and academic research highlight the prevalence of fraud and other unethical behaviors in organizations (e.g., Herman 2005, Speights and Hilinski 2005). These sources show that employees violate company rules, consumers shoplift, accountants misreport financial information, students cheat on exams, workers evade taxes, and managers overstate performance to superiors. Such unethical behaviors are costly to organizations. According to a recent estimate, employee theft on its own causes U.S. companies to lose approximately \$52 billion per year (Weber et al. 2003). An epidemic of corporate fraud by organizations such as Enron, Worldcom, and Parmalat in one year accounted for an estimated \$37–\$42 billion loss to the U.S. gross domestic product (Graham et al. 2002). Fraudulent narcotic prescriptions, which often involve complicity by health-care workers and pharmacists, cost health insurers up to \$72.5 billion per year.¹

The economic importance of these illegal activities has generated considerable interest among academics. Yet, to date, researchers have focused primarily on the motives and characteristics of the perpetrators or on the organizational and environmental pressures that influenced their actions. This body of work has overlooked an important factor that may explain and predict employees' likelihood to cross legal boundaries: the victims and beneficiaries of illicit actions. Recent studies in both the psychology and economics literatures show that the

identity of victims and beneficiaries can generate biases and taste-based discrimination in otherwise legal activities, including hiring (e.g., Bertrand and Mullainathan 2004), employment decisions (Dovidio and Gaertner 2000), judicial decisions (Dovidio et al. 1997), and performance evaluation (Zitzewitz 2006). Although the act of discrimination itself is frequently unethical and sometimes illegal, the actions in which they discriminate, such as hiring or judgment, are inherently not.² We extend this research by examining discrimination in activities that are inherently illegal, such as fraud, theft, or corruption, and explore the mechanisms behind this particularly egregious class of discrimination.

In this paper, we argue that perpetrators of wrongdoing engage in wealth-based social comparison processes with identifiable victims or beneficiaries, ultimately leading to discriminatory illicit actions. We focus on transactions between employees and customers and argue that employee interactions with customers across socioeconomic strata create social comparisons that can lead to wealth-based discrimination against customers. We suggest that social comparisons based on wealth evoke two potential emotional reactions—envy and empathy—that, in turn, lead to illegal behavior. Strong reactions of envy may develop in employees who compare unfavorably to customers with visible wealth manifested in physical appearance or clothing, vehicles, and other possessions. Strong reactions of empathy

instead may develop in employees who compare to customers they perceive as similar based on their wealth.

Although undesirable for employers, many behavioral manifestations of envy and empathy are legal. A greater concern is if envy and empathy influence employee decisions to selectively engage in illicit behavior based on perceptions of customer wealth. Popular culture has often glorified or justified such behavior, referring to such discriminators as “Robin Hoods,” after the legendary bandit of medieval England. Robin Hood explicitly stole from the rich to give to the poor, yet many illegal activities that appear to costlessly help the destitute, such as insurance fraud, increase costs across broader populations. We argue that the emotional experience of envy and empathy can create wealth-based discrimination where empathetic employees illegally *help* those of similar economic status and either fail to help or illegally hurt those they envy. Where the risk of being caught is low, as in the settings we consider in the present research, employees are free to act on emotions such as envy and empathy and, as a result, engage in discriminatory illegal behavior in employee–customer relations.

We complement our theoretical discussion with novel empirical analysis, pairing extensive field-based data with laboratory experiments. We investigate the behavioral consequences of wealth-based discrimination in the context of vehicle emissions testing, where widespread anecdotal evidence and state enforcement records demonstrate fraudulent testing behavior within private firms (Hubbard 1998, 2002; Pierce and Snyder 2008). Inspectors interact with customers across socio-economic strata, whose wealth is visibly demonstrated in the type of car they own. The many types of cars encountered by inspectors create variation in the social comparisons involved in the inspection transaction, allowing for identification of customer-specific fraud rates for individual inspectors.

Using a database of over six million emissions tests from a metropolitan area from 2001 to 2004, we identified relative levels of leniency for individual inspectors and customer wealth based on their ownership of luxury versus standard vehicles.³ This leniency, in the strictly regulated process of the emissions test, represents likely fraud against the state. We find that for a significant number of inspectors, leniency is much higher for those customers owning standard vehicles versus those with luxury cars. These “Robin Hoods,” although not explicitly stealing from the rich, nevertheless help lower-income customers at an environmental and health cost to all. We show that the large number of discriminatory inspectors is highly unlikely to be caused by fundamental differences in the vehicles and more likely based in discretionary fraud. Furthermore, we find evidence that these effects are correlated with median household income from the testing facilities’ census tracts, providing some support for

the importance of firms’ profit incentives in pressuring inspectors to help core customers. These results, although representing only one-half of the redistributive “Robin Hood effect” described in the economics literature (Hirschleifer 1976), represent the same wealth-based behavioral bias toward the poor.

These data are unable to identify economic and psychological mechanisms behind discriminatory fraud. Consequently, we used a laboratory experiment to identify how envy and empathy influence individuals’ likelihood to illegally help others. Our experiment shows that individuals are more willing to illegally help peers with standard rather than luxury cars. A mediation analysis shows that envy and empathy explain much of this discriminatory help. Collectively, these results demonstrate the potential presence of wealth-based discrimination in employee–customer relations and in relations between peers, and highlight the role of envy and empathy toward customers in driving much of this discriminatory illegal behavior.

Theory and Hypothesis Development

Wealth and Illegal Behavior

Considerable evidence shows that individuals discriminate against certain categories of people in both economic transactions and personal treatment of others. This discrimination may be based on race (Price and Wolfers 2007, Parsons et al. 2007), geography (Zitzewitz 2006), or other personal characteristics. Both economists and psychologists have shown that race- and religion-based preferences can influence decisions in a variety of contexts including hiring (Bertrand and Mullainathan 2004), prices of sports cards (Nardinelli and Simon 1990), and organizational membership (Moser 2008), and they can lead to unintended discrimination (Greenwald and Banaji 1995). Although much of the evidence and theory suggest implicit bias rather than deliberate action, this research nevertheless implies that factors such as wealth, gender, or ethnicity may lead those in power to favor those similar to them on these dimensions.

In employee–customer relations, discrepancies in income or wealth are often apparent and are likely to be used as a significant reference for social comparisons. As a result, similarity in wealth may drive employee decisions on whether to help customers skirt or break legal rules or social norms. Prior research has shown that perceived similarity is associated with greater levels of liking and positive affect (Byrne et al. 1971, Chen and Kenrick 2002, Rosenbaum 1986). Perceived similarity is also associated with higher levels of emphatic concern and prosocial behavior (e.g., Batson et al. 1981, 1995c; Batson and Staw 1991; Hornstein 1978; Krebs 1975; Suedfeld et al. 1971). Though its intentions are often good, helping behavior driven by similarity in wealth may violate employer rules or may be explicitly

illegal. Examples include auditors passively or actively helping misrepresent client finances (Dies and Giroux 1992, Mautz and Sharaf 1961), insurance administrators or doctors approving uncovered expenses (Ma and Maguire 1997), or professors giving unearned grades to students. More generally, we expect that when employees engage in social comparison processes with customers, they help those of similar wealth. This may result in illegal acts that discriminate in their favor. We hypothesize the following.

HYPOTHESIS 1. *Employees are more likely to engage in illegal behavior when it helps customers with a similar income level than when it aids customers with a dissimilar income level.*

Because employees in our sample are of lower income, this hypothesis implies that they are more likely to illicitly help low-income customers rather than wealthy customers. Illegal helpful behavior may occur also in the case of a wealthy employee serving a poor customer, as in professions where employees earn high levels of income (e.g., medicine, law). Although laboratory evidence suggests that this dishonest helping occurs under conditions of positive inequity (Gino and Pierce 2009), we cannot test this in the empirical settings of this paper, where employees are of lower income levels.

Empathy and Illegal Helping Behavior

A long stream of psychology research has shown that empathy, defined as “an other-oriented emotional response congruent with the perceived welfare of another person” (Batson et al. 1988, p. 52), motivates people to help others (Coke et al. 1978, Eisenberg and Miller 1987, Krebs 1975). Prior work has suggested two main explanations for the empathy–helping link. According to the first explanation, empathy increases willingness to help others even in the absence of personal gain (Batson et al. 1981, 1983). Other researchers have proposed a more egoistic explanation according to which empathetic individuals are more likely to help others because they anticipate empathy-specific punishments for failing to help, such as guilt and shame, and egoistically want to avoid them (Archer et al. 1981, Batson 1987, Batson et al. 1988, Cialdini et al. 1987, Dovidio 1984). Consistent with this explanation, Cialdini et al. (1997) have found that relationship closeness and similarity with a needy other lead to greater empathic concern, and that egoistic motivation explains helping behavior.

The importance of empathy in helping behavior has also been recognized by economists and sociologists. To Smith (1982) and Hume (1978), individual behavior affecting others may be greatly influenced by the relationship of those persons to the decision maker (Sally 2002). Lack of social distance among competitors may

reduce intensity of competition (Podolny and Scott-Morton 1999), and may even lead to illegal implicit collusion (Sally 2002). Similarly, Dimaggio and Louch (1998) found that the relationship between buyers and sellers was critical in reducing the severity of deception in the used car market.

The role of empathy in increasing helping behavior may extend to fraudulent actions as well. Studies of student cheating have shown that up to 37% of university students have helped classmates cheat on a test (Bowers 1964, McCabe and Trevino 1997). In a survey of 354 university students, about 7% of acknowledged cheaters explained their behavior through higher loyalties related to friendship. This evidence is consistent with findings suggesting that the presence of an existing relationship influences the likelihood of individuals to bend or break rules (Brass et al. 1998, Gino et al. 2009). Just as empathy based in existing relationships may provide the strongest motivation for helping others cheat, empathy may drive similar behavior even among relative strangers. So long as individuals perceive the stranger as belonging to the same group, they may favor that person in ethically ambiguous situations. Empathy may lead to behavior that is beneficial to an individual but illegal, unfair, or unethical toward greater society (Batson et al. 2004). For instance, Batson et al. (1995b) found that empathy can lead to unfair allocations of scarce resources, with earlier work suggesting this behavior may reduce social welfare and common good (Batson et al. 1995a). Gino and Pierce (2009) showed that when individuals feel empathy toward referent others in positions of negative inequity, they behave dishonestly through helping, even when helping is economically costly to them. Given these findings, we hypothesize the following.

HYPOTHESIS 2. *Empathy increases the likelihood of employees helping customers through illegal acts.*

Envy and Illegal Behavior

Just as empathy may inspire an employee to illegally help a customer, envy may drive the same employee to refuse help to another customer or even illegally harm them. When the customer is wealthier than the employee, the employee might feel envy toward his customer and motivated to hurt her. Envy, an emotion experienced “when a person lacks another’s superior quality, achievement, or possession and either desires it or wishes the other person lacked it” (Parrott and Smith 1993, p. 906), occurs when one compares her own outcomes to the larger outcomes of others (Smith et al. 1988) and it frequently arises among workers and managers within organizations (Vecchio 1995, 1997; Stein 1997; Duffy and Shaw 2000). It can include feelings of inferiority and resentment, a desire for the larger outcomes (Parrott and Smith 1993), and a sense of injustice

due to the disadvantageous position one is in, even when the disadvantage is purely subjective (Smith et al. 1994).

Envy can levy substantial weight on individuals' ethical behavior (Schweitzer and Gibson 2008). It can stimulate harmful unethical behavior (Cropanzano et al. 2003, Pruitt and Kimmel 1977, Smith and Walker 2000) by those overestimating personal contribution (Zenger 1994) or experiencing true inequity (Gino and Pierce 2009), leading to overt hostility (Brigham et al. 1997, Duffy and Shaw 2000) and deception (Moran and Schweitzer 2008). Whereas these behaviors are actively harmful, envy may also reduce the willingness of individuals to help others. Parks et al. (2002) demonstrate that unequal outcomes and dispositional envy reduce cooperation. Similarly, Gino and Pierce (2009) find that inequitable outcomes generate situational envy and motivate people to dishonestly hurt others.

Recent research argues that envy has major implications for individual behavior in organizations, including effort, attrition, and sabotage (Nickerson and Zenger 2009). Envy in work settings leads to reduced job-related esteem, which in turn generates a set of responses intended to rectify the threatening circumstances (Latack and Havlovic 1992). Although most work on envy in organizations focuses on comparisons between employees, worker envy can also develop in relation to customers. Employees interacting with wealthy customers are likely to engage in social comparison, where wealth disparity may become apparent to them. A wealthy customer might alert an individual to her own lack of resources. This social comparison can then create envy toward the wealthy customer and lead the employee to engage in unethical behavior that harms the wealthy other. Similarly, when not stimulating harmful behavior, envy may counteract a willingness of the employee to help the customer. Otherwise, helpful employees may offer little aid to customers toward whom they feel wealth-based envy. This reluctance to help may apply to simple discretionary tasks, such as answering questions, or to more illicit aid, such as exaggerating health conditions, serving alcohol to minors, or overvaluing insurance losses. Harmful behavior stimulated by envy translates in our context into hypothesizing that envy would increase an employee's likelihood to engage in illegal behavior to harm their wealthy customers. Although we acknowledge this to be an important consequence of envy, we refrain from formally hypothesizing this effect because it is not clear that envy alone would drive harmful behavior. Instead, we limit our focus to the effect of envy limiting helpful behavior. We therefore hypothesize the following.

HYPOTHESIS 3. *The experience of envy reduces an employee's likelihood to engage in illegal behavior to help their customers.*

Envy and Empathy as Sources of Discrimination

Although the literature on intraorganizational envy and empathy is extensive, little is known about employee experiences of envy or empathy toward customers. Notably, these emotions and their behavioral manifestations can have major consequences for organizations when they lead to unethical behaviors that hurt firm performance. In the same way that Nickerson and Zenger (2009) describe potential sabotage and misrepresentation within the workforce, envy or empathy toward customers can lead to employee behavior detrimental to the firm. Empathy may drive employees to illegally aid customers, whereas envy may reduce this tendency or even lead employees to illegally harm customers. Considering that wealth is a significant reference for social comparisons, the perception of customer wealth may reduce empathy and increase envy among employees of low personal wealth. This increased envy and reduced empathy have the same implications for the likelihood that employees help customers through illegal behavior. Because both reactions to perceived wealth reduce the likelihood of helping others, a discriminatory pattern of illegal behavior can develop. High envy and low empathy generate little aid to wealthy customers through illegal behavior, whereas low envy and high empathy encourage employees to help less wealthy customers. Based on this reasoning, we expect envy and empathy to create patterns of discriminatory illegal behavior. We thus hypothesize the following.

HYPOTHESIS 4. *The experiences of envy and empathy mediate the relationship between customer wealth and employees' likelihood to engage in illegal helpful behavior.*

Empirical Approach to Hypothesis Testing

These hypotheses suggest the presence of wealth-based discrimination in employee–customer relations and propose that such discrimination is rooted in emotional reactions to the perceived wealth of others. Although ideally we would test all hypotheses in organizational settings, psychological mechanisms are extremely difficult to observe in large-scale markets. Consequently, we first tested the behavioral consequences of envy and empathy using data from the vehicle emissions testing market, where employees can illegally help customers pass tests. Our first study examines Hypothesis 1—the relative effects of a customer's wealth on employee likelihood to illegally help customers. Although this study can identify patterns of discriminatory fraud, it is unable to identify the psychological mechanisms behind them. Consequently, we use a controlled laboratory setting to explore the role that envy and empathy might play in driving these illegal decisions. Our laboratory study also allows us to test Hypotheses 2–4.

Study 1: Empirical Setting

The vehicle emissions testing market in the United States has considerable potential for illegal behavior. The U.S. Environmental Protection Agency mandates which states must institute vehicle emissions programs yet leaves the implementation of these programs to the states. Some states directly test vehicles at state-owned facilities, but the majority outsource some or all testing to privately owned licensed firms. Emissions inspectors working at these private facilities are legally required to follow strict testing procedures yet have numerous opportunities to diverge from these policies. With dynamometer-based tailpipe testing common in many regions, skilled mechanics can make temporary adjustments that allow almost any vehicle to pass emissions tests without addressing the underlying causes of the excess pollution.⁴ Even the most polluting cars can be certified clean when inspectors substitute other cars during testing procedures. Evidence from Hubbard's (1998) study of California inspections suggests such fraud is quite common, similar to a 2001 covert audit program in Salt Lake City, Utah, that found nearly 10% of facilities overtly testing one car in place of another (Groark 2002).

Not only do inspectors have opportunities to cheat, they often have strong incentives to do so. Hubbard (2002) identified financial incentives behind this fraud, noting that customers are more likely to return to inspection stations that have previously passed them for both future inspections and unrelated repair work. Similar results were found in the automotive repair market (Taylor 1995) and in medical care (Gruber and Owings 1996). Firms in the emissions testing market tend to profit from illegal behavior; by fraudulently passing older cars, they ensure that these cars will remain on the road and in need of future mechanical repairs. By contrast, customers who fail emissions tests are likely to buy new cars that need little if any repair work. Similarly, competition among emissions testing facilities may inspire inspectors to cheat to please customers and win business. Furthermore, short of engaging in covert investigations, the state is limited in its ability to ensure that testing is being carried out legally. Discussions with the state agency suggest that covert audits are very rare due to the unwillingness of state workers to participate in them.

Financial incentives may explain much of the fraud in the vehicle emissions testing market, but the personal preferences of individual inspectors could be another factor. Inspectors might choose to help friends or family pass emissions tests without any excess payment, explicit or implied. Even when no prior relationship exists between customer and employee, empathy or envy may influence an employee's willingness to break both organizational rules and the law. Mechanics earn low to medium average salaries. Indeed, the U.S. Bureau of Labor Statistics reports that the average hourly wage

of an automobile mechanic in 2004 was \$15.40. These wages suggest that mechanics are likely to relate most closely to customers with similar or lower incomes; this empathy may motivate them to illegally aid peers for free or for lower side payments. By contrast, customers with luxury cars may instead engender envy from the inspector, or merely lack of empathy, with both cases providing less motivation for fraudulent help. Inspectors who suffer severe envy may even fraudulently fail luxury cars. Consequently, if wealth-based empathy or envy influence inspectors' propensity to help customers' cars pass emissions tests, we should observe differential levels of fraud between a given inspector's portfolio of standard and luxury vehicles.

Data

Our data set comes from the Department of Motor Vehicles of a large northern U.S. state, where emissions testing is conducted by licensed private firms. It contains all vehicle inspections conducted between 2001 and 2004 for gasoline-powered vehicles under 8,500 pounds and includes vehicles owned by individuals, corporations, fleets, and government agencies. Only those vehicles in dense urban areas are included, because only these vehicles were required to be tested. The data collected during inspections included inspection date, inspection time, vehicle identification number, facility identifiers, inspector identifiers, and inspection results. These data allowed us to uniquely identify vehicles, including characteristics such as make, model, year, and odometer reading. Although unique inspector IDs allowed us to identify which inspectors conducted which tests, we did not know the inspectors' names. The detailed information on the time and location of inspection as well as vehicle characteristics allow us to control for most predictors of vehicle deterioration and likely emissions.

Empirical Approach and Results

Our empirical approach is to identify wealth-based discrimination in emissions testing by comparing each inspector's leniency toward wealthy customers with their leniency toward others. First, we define perceived customer wealth by splitting each inspector's car portfolio into "standard" and "luxury" segments. Using our emissions testing data, we separated luxury vehicles from standard vehicles by both make and age, categorizing all vehicles 10 years old or older as "standard," regardless of make, under the premise that a 12-year-old BMW would not be a clear indication of wealth. Table 1 lists luxury and standard segments by vehicle make. Second, for each inspector we use a probit model to simultaneously measure two relative leniency levels by identifying their average pass rates while controlling for time, vehicle, geographic, and facility characteristics. We then used Wald tests to identify whether leniency for standard

Table 1 Standard and Luxury Segments

Standard		Luxury	
Daewoo	Mazda	Acura	Jaguar
Honda	Geo	Rolls Royce	Lexus
Hyundai	Lincoln	Alfa Romeo	Lotus
Buick	Nissan	Aston Martin	Lamborghini
Chevrolet	Mercury	Audi	Maserati
Chrysler	Mitsubishi	Bentley	Porsche
Dodge	Oldsmobile	BMW	Saab
Volkswagen	Subaru	Cadillac	Volvo
Renault	Plymouth	Infiniti	Ferrari
Kia	Pontiac		Mercedes-Benz
Eagle	Toyota		
Ford	Suzuki		
Peugeot	Saturn		
Fiat			

and luxury cars differed for each inspector, interpreting differences as evidence of inspectors discriminating based on customer wealth. Inspectors favoring luxury car owners are deemed “luxury helpers,” whereas those favoring standard car owners are referred to as “Robin Hoods.” We also generated a counterfactual distribution of inspector-based discrimination through several Monte Carlo simulations to identify discriminators generated purely by data noise. Finally, we show that inspectors’ discrimination measures at multiple jobs are correlated.

Our analysis relies on two key assumptions. First, we assume that systematically high pass rates for individual inspectors reflect discretionary fraud. We believe we are able to control for nearly all characteristics of the vehicle and test that might legitimately influence emissions test results across an inspector’s portfolio of cars. Although vehicles certainly have idiosyncratic characteristics influencing their emissions output, these idiosyncrasies are unlikely to be consistent across an inspector’s entire portfolio of thousands of vehicles. Similar to the approach used in literature on worker productivity (Mas and Moretti 2009) and lawyer and surgeon skill (Abrams and Yoon 2007, Huckman and Pisano 2006), we consider systematically high or low pass rates to reflect inspector-specific behavior. In the context of emissions testing, we will refer to this behavior as “leniency.” But in the strictly regulated emissions testing market, discretionary behavior for inspectors is essentially prohibited. Consequently, the discretionary behavior that constitutes worker-specific leniency, in the form of abnormally and systematically high pass rates, almost certainly reflects some degree of illegal behavior.

Our second assumption is that inspectors associate luxury cars with wealth. Given their presumed “insider” knowledge of car prices and the correlation between wealth and car price, we believe this is an accurate assumption. Although personal wealth is not perfectly correlated with vehicle price, the average income of luxury car buyers is markedly higher than that of those who purchase cars in other segments.⁵ Consistent with

Hypothesis 1, we expect to find significantly higher inspector fraud levels (as measured by leniency) for standard cars than for luxury cars.

Car Types and Perceptions of Wealth

We first support our assumption that emissions inspectors associate luxury cars with wealth using data from a laboratory experiment. Forty college students (48% male) participated in a short study in exchange for class credit (mean age = 20, standard deviation (SD) = 0.96). In the study, participants were asked to look at 10 pictures of different luxury and standard cars and to answer a few questions about the cars.⁶ The order in which cars were presented to participants was counterbalanced. For each car, participants were shown a picture and information about the model and its average selling price (e.g., model: 2007 Chevrolet Silverado; price: \$23,280). Car prices were included to simulate mechanics’ accurate knowledge of car prices. Participants were then asked to estimate the wealth of the car owner. The study employed two conditions, across which we varied how the second question was formulated. In one condition, participants were asked, “How much money do you think the owner of this car makes per month?” In a relative-value condition, participants instead were asked, “How wealthy do you think the owner of this car is?” using a seven-point scale for both questions (from 1 for not very wealthy to 7 for very wealthy).

Car type affected participants’ perception of car owner wealth. In the income condition, owners of luxury cars were rated as wealthier (mean monthly income = \$14,824, SD = 2,168) than owners of standard cars (mean monthly income = \$5,952, SD = 860; $F(1, 9) = 8.36$, $p = 0.018$, $\eta^2 = 0.48$). The same results were replicated in the relative-value condition (5.46 for luxury cars (SD = 0.42) versus 3.52 for standard cars (SD = 0.49), $F(1, 9) = 147.62$, $p < 0.001$, $\eta^2 = 0.89$). Taken together, these results support the assumption that mechanics (and people more generally) associate a luxury car with wealth more often than a standard car. In reality, mechanics are much more likely than the general public to accurately associate luxury cars with wealth, given their market knowledge and experience with car owners.

Identifying Likely Fraud Levels

We identify likely fraud by estimating how an inspector affects the probability of a vehicle passing an emissions test while controlling for vehicle, time, geographic, and facility characteristics that may be correlated with vehicle emissions. We identify this leniency separately for the inspector’s luxury and standard car portfolios. After controlling for the major factors that might create systematic emissions differences, we interpret any inspector-level effect on pass rates as discretionary leniency that likely reflects fraud. Inspector-standard

and inspector-luxury fixed effects represent the segment-specific relative leniency for each inspector. We estimate the segment-specific inspector fixed effects at the vehicle level using the following probit model:⁷

$$\Pr(\text{Pass}_{i,c,t} = 1) = \Phi(\theta_i + \varphi_i + \beta X_c + T_i + G_i). \quad (1)$$

Pass is a dummy variable indicating whether or not the vehicle passed; θ_i is a set of standard-segment fixed effects for each inspector; φ_i is the set of luxury-segment fixed effects specific to each inspector i ; X_c is a set of control variables including a model year quadratic, an odometer quadratic, and vehicle make effects; T_i is a set of month, year, and month/year fixed effects; and G_i is a set of zip code fixed effects and an *equipment quality* measure. We included zip code fixed effects to control for location-specific vehicle characteristics at the segment level. If, for example, individuals in certain areas maintained luxury cars better than standard cars, relative to other areas, this may appear as “fraud” in our results. We controlled at the three-digit zip code level, because the number of inspectors within actual zip codes was very limited. The *equipment quality* measure attempts to control for facility-specific mechanical bias in testing by using only those cars manufactured after 2001. In our data, this subsample very rarely fails an inspection. We measure the quality of equipment at a given facility by examining the carbon monoxide readings on this subsample of cars, data that are minimally contaminated by fraud due to the almost certainty of legitimate passing. Facilities that have relatively higher carbon monoxide readings from this subsample are assumed to have “stricter” machines.

The fixed effects θ_i and φ_i reflect relative pass-rate differences between inspectors and between car segments, given inspectors’ portfolios of cars within each segment. We used an unconditional fixed effects probit model for computational reasons. Given that the number of observations within each inspector/segment group is at least 50, unconditional fixed effects suffer little if any bias (Katz 2001). This model is adapted from similar work in health economics (Huckman and Pisano 2006) and studies on worker productivity (Mas and Moretti 2009) and discretionary behavior (Pierce and Snyder 2008) that estimate worker-specific effects using logit and ordinary least squares (OLS) models.

As an example, suppose that inspector A tests 1,000 standard vehicles and 300 luxury cars, whereas inspector B tests 800 standard vehicles and 250 luxury cars. In the context of Equation (1), θ_a and θ_b represent the inspector fixed effects for the two inspectors’ standard cars. Similarly, φ_a and φ_b represent each inspector’s fixed effect for their luxury car portfolios. Positive fixed effects reflect higher pass rates not justified by the time of the test or the type of vehicle; these fixed effects reflect lenient inspectors who are likely fraudulently aiding customers in passing emissions tests.

Because higher coefficients for θ_i and φ_i reflect a higher likelihood of fraud for inspector i , we expect that wealth-based discrimination would be represented by a larger coefficient for an inspector’s standard-segment fixed effect than for her luxury-segment effect. For example, a value of 0.1 for inspector A’s standard-segment effect contrasted with 0.02 for her luxury-segment effect would represent her passing standard vehicles 8% more often than luxury cars, given vehicle characteristics. It is important to remember that because our model includes car make fixed effects, differences in pass rates across segments are already controlled for. In addition, zip code-specific car segment dummies control for geographic variation in segment-specific emissions. To test for the wealth-based discrimination, we run postestimation Wald tests on the null hypothesis that $\theta_i = \varphi_i$ for each inspector i . The fixed effects probit model drops all observations perfectly predicted within group. Because the average pass rate of vehicles in our sample is 93%, part of our sample is dropped in a biased manner, because it eliminates those inspectors who never failed a vehicle. This bias likely understates the number of identifiable highly lenient inspectors. We forced Stata to drop the median leniency inspector in our fixed effects estimation, such that all inspector fixed effects are approximately differenced from the average pass rate.

Sample

For estimating our model, we used only inspectors with the largest test portfolios. There are two reasons for this sampling strategy. First, our model requires a large number of luxury car inspections for each individual inspector. Luxury cars make up only 7% of inspections, and because pass rates for luxury cars are extremely high (97%), inspectors with smaller portfolios may show no variation in luxury car pass rates. This homogeneity would nearly eliminate the possibility of accurately estimating inspectors’ segment-specific biases, because probit models automatically drop perfectly predicted groups. Second, our computationally intensive model requires us to use a small sample of inspectors. We therefore used all 249 inspectors with over 3,500 total inspections who failed at least one car.⁸ This sample allows for estimation of segment-specific fixed effects but limits our ability to identify low-volume inspectors.⁹ Summary statistics for the general population and our probit sample are presented in Table 2.

Probit Results

Our probit model suggests widespread discrimination favoring standard car owners. Column 1 of Table 3 presents the number of inspectors in the probit model whose leniency differed across car segments when tested using Wald tests of the null hypothesis $\theta_i = \varphi_i$. Noncumulative counts of Wald tests significant at the 0.1%, 1%, 5%, and 10% levels are presented, broken down

Table 2 Summary Statistics

Variable	Observations	Mean	SD	Min	Max
Probit sample					
<i>Odometer</i>	1,147,872	101,826	69,910	1	999,999
<i>Age of vehicle</i>	1,147,872	8.84	4.27	2	21
<i>Luxury segment dummy</i>	1,147,872	0.07	0.26	0	1
<i>Pass rate</i>	1,147,872	0.93	0.24	0	1
<i>Standard-segment pass rate</i>	1,067,473	0.93	0.25	0	1
<i>Luxury-segment pass rate</i>	80,399	0.97	0.15	0	1
<i>Median household income</i>	1,134,209	48,025	21,758	14,271	134,325
Number of inspections per inspector	249	4,693	1,283	3,502	11,917
Population					
<i>Odometer</i>	9,927,647	54,617	60,500	1	999,999
<i>Age of vehicle</i>	9,927,647	8.09	4.36	2	21
<i>Luxury segment dummy</i>	9,927,647	0.09	0.28	0	1
<i>Pass rate</i>	9,927,647	0.93	0.25	0	1
<i>Standard-segment pass rate</i>	9,070,348	0.93	0.26	0	1
<i>Luxury-segment pass rate</i>	857,299	0.98	0.15	0	1
<i>Median household income</i>	9,521,215	55,152	22,533	14,271	173,368
Number of inspections per inspector	18,763	529.00	802.00	1	11,917

by those inspectors who favored standard vehicles and those favoring luxury cars. Of 249 inspectors identified, 74 were significant at the 10% level, with 27 significant at the 1% level. The mean inspector’s fixed effects were necessarily dropped as a baseline for others in the probit model. We present segment-specific fixed effects and Wald tests for the best-identified inspectors in Table 4, whose Wald tests of discrimination are significant at the 1% level. Inspector 17753, for example, was, on average, 1.8% more lenient than the average inspector for standard cars, while being 8.1% more strict on luxury cars. The difference between these coefficients of 9.9% is significantly different from zero at the 0.1% level. Figure 1 presents the rank-ordered distribution of all inspectors’ favoritism toward standard cars ($\theta_i - \varphi_i$). Hollow diamonds represent those inspectors whose measures of favoritism ($\theta_i - \varphi_i$) are significant at the 1% level, whereas Xs represent the difference when not significant

at this level. Inspector 17753 is the hollow diamond at the far right side of the distribution.

Although 16 of 20 inspectors identified at the 0.1% level favored standard cars, consistent with our hypotheses, a number of inspectors favored luxury cars. Given the high pass rate for luxury cars (and thus the truncated right-side error distribution), we were concerned that many of our identified discriminators could be products of misspecification.¹⁰ Although misspecification would not necessarily bias the coefficients, it might inflate or deflate standard error calculations, which could create spuriously significant inspectors. We therefore explored whether these discriminatory effects were noise generated by the structure of the data by constructing a counterfactual distribution of inspector effects through Monte Carlo simulations. Our simulation process involves randomly reassigning vehicles to inspectors within our sample of 259 inspectors.¹¹ Each inspector still maintains the

Table 3 Number of Identified Discriminators

	Wald test	Model 1 (probit)	Placebo 1	Placebo 2	Placebo 3	Average placebo (33 repetitions)
Inspector fixed effects favoring standard vehicles	Sig. at 10% level	6	0	10	4	1.36
	Sig. at 5% level	13	0	3	2	0.76
	Sig. at 1% level	2	0	0	0	0.18
	Sig. at 0.1% level	16	0	0	0	0.00
Inspector fixed effects favoring luxury vehicles	Sig. at 10% level	13	12	15	20	15.39
	Sig. at 5% level	15	12	12	13	11.52
	Sig. at 1% level	5	3	0	0	1.09
	Sig. at 0.1% level	4	0	0	0	0.00
		74	27	40	39	30.30
Nondiscriminators	Not significant at 10%	175	232	218	219	228.52
Total inspectors		249	259	258	258	258.82

Note. Sig., significant.

Table 4 Twenty-Seven Discriminatory Inspectors (Identified at the 1% Level)

Inspector ID	Probit model with inspector FE						Firm FE	
	Standard		Luxury		Coeff. diff.	Wald test (Pr > χ^2)	Coeff. diff.	Wald test (Pr > χ^2)
	dF/dx	RSE	dF/dx	RSE				
Robin Hoods								
17753	0.018	0.003	-0.081	0.034	0.099	0.000	-0.002	0.938
2502	0.028	0.002	-0.051	0.026	0.080	0.000	0.153	0.054
14238	0.013	0.002	-0.060	0.040	0.072	0.006	0.058	0.138
15751	0.021	0.002	-0.044	0.021	0.065	0.000		
3481	0.024	0.002	-0.040	0.032	0.063	0.001	0.073	0.118
12911	0.017	0.003	-0.044	0.030	0.062	0.001		
6484	0.008	0.003	-0.052	0.017	0.060	0.000	0.012	0
14870	0.013	0.003	-0.041	0.023	0.054	0.001		
7456	0.023	0.002	-0.029	0.020	0.052	0.001	0.069	0.007
571	0.022	0.002	-0.024	0.020	0.046	0.000	0.153	0.054
14049	0.039	0.001	-0.007	0.018	0.046	0.000	0.124	0
42	0.034	0.001	-0.007	0.020	0.041	0.000		
16265	0.023	0.002	-0.016	0.017	0.039	0.001	0.025	0.087
928	0.014	0.002	-0.022	0.017	0.036	0.004		
5294	0.010	0.004	-0.024	0.010	0.034	0.000		
6177	0.039	0.001	0.007	0.019	0.031	0.001		
13538	0.024	0.002	-0.006	0.012	0.030	0.001		
8602	0.042	0.000	0.028	0.010	0.013	0.000		
Luxury helpers								
16964	0.013	0.004	0.028	0.004	- 0.015	0.009	-0.037	0
6411	-0.012	0.005	0.017	0.008	- 0.029	0.008		
9780	0.000	0.004	0.030	0.005	- 0.030	0.001	-0.016	0.41
16546	-0.033	0.005	0.012	0.011	- 0.045	0.008	-0.059	0.034
17347	-0.033	0.005	0.014	0.006	- 0.047	0.000	0.04	0.677
9593	-0.034	0.005	0.013	0.011	- 0.047	0.004		
8664	-0.051	0.006	0.002	0.012	- 0.053	0.001		
8794	-0.041	0.005	0.026	0.011	- 0.066	0.008	-0.042	0.213
6538	-0.109	0.008	-0.007	0.019	- 0.102	0.001	0.022	0.576

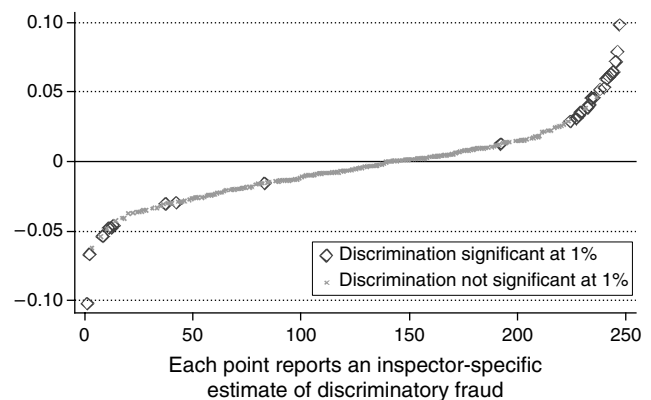
Notes. The inspector numbers were generated randomly by the authors and are not government license numbers. FE, fixed effects; RSE, robust standard errors.

same portfolio size for each car segment (standard and luxury), but the composition is different. This process, equivalent to bootstrapping the true error distribution,¹² involves creating placebo inspectors for each vehicle test in our sample.¹³ From this procedure, we can construct a counterfactual distribution of the fictional inspector fixed effects, where differences are only driven by the noisiness of small samples. This counterfactual distribution is equivalent to an experimental control condition such as a placebo pill, where we establish a null hypothesis against which to test our treatment effect.

The null hypothesis of our simulation is that the number of statistically significant discriminators would be identical in the simulation to those in the real data at all levels of statistical significance. We repeated our probit model using each of 33 sets of Monte Carlo-generated placebo inspectors to build the counterfactual distribution of discriminatory effects.¹⁴ Table 3 presents the number of inspectors identified as discriminators in three repetitions of the bootstrapped models as well as the mean counts of identified discriminators from all 33 repetitions.

One can readily observe several patterns from the placebo models. First, the placebo models produced significantly fewer Robin Hood discriminators than Model 1, showing that the results from the probit model are not purely observations of noise. In none of the 33 repetitions was a Robin Hood randomly generated at the

Figure 1 Discrimination Measures for Each Inspector

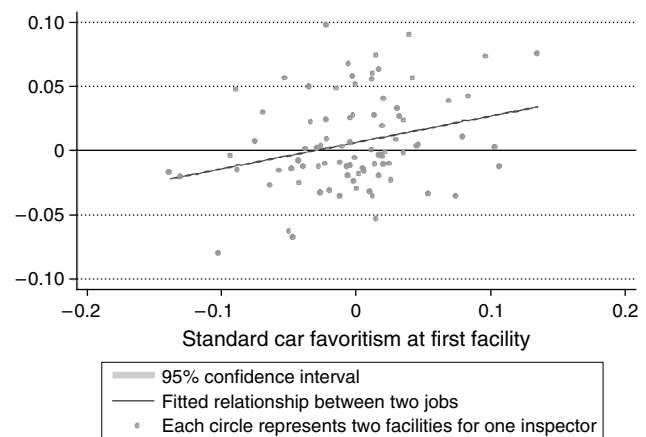


0.1% significance level, compared with 16 in the real data. In only one of the repetitions (Placebo 2 shown in Table 3) were there more Robin Hoods generated at any level than in our pool of real inspectors. Second, the simulations consistently produced large numbers of inspectors who appear to be helping luxury vehicles. This suggests that most of the 28 “luxury helpers” identified with statistical significance between 5% and 10% are randomly generated due to the structure of the data. We believe that only the luxury helpers significant above the 1% level can be identified as true discriminators, because they were rarely generated in simulations. In contrast, most of the Robin Hoods significant at the 5% level are likely true discriminators, given that we were unable to reproduce such significant Robin Hood discriminators through simulation. Given that the average simulation produced approximately 2 Robin Hoods and nearly 28 luxury helpers, as opposed to the 37 inspectors of each type in Model 1, we therefore estimate there are approximately 35 Robin Hoods and 9 luxury helpers. But we feel that using the 1% cutoff level to designate discriminators is a much more conservative approach, given the rareness of such significance in our simulations. This highly conservative level yields 18 Robin Hoods and 9 luxury helpers.

One concern with our analysis of individual fixed effects is that we cannot adequately separate individual from firm-level discrimination. As we noted, there are strong financial incentives for facilities to fraudulently pass frequent customers. Managers and owners are therefore likely to put pressure on inspectors to conform to the goals or norms of the firm, a result supported by Pierce and Snyder (2008). Unfortunately, inspection facilities are small firms with limited numbers of employees, so empirically separating individual behavior from firm policies and protocol is not practical. We attempted to include facility fixed effects in our probit model, but the heavy collinearity from few inspectors per facility made standard error estimation impossible. Furthermore, as with any study on peer effects, such identification would suffer from Manski’s (1993) reflection problem, where identification of a group’s influence on individuals is confounded by possible exogenous determinants of performance, correlations in unobserved individual characteristics, or two-way causality. In Table 4, we present firm fixed effects calculated for the facilities of our precisely identified discriminators, using only those inspectors *not* in our sample. Not surprising, these firm fixed effects are similar in direction to our inspector fixed effects, suggesting inspectors within firms engage in similar discrimination. This is consistent with findings in Pierce and Snyder (2008) that 18%–20% of inspector-specific fraud is firm specific, although their findings say nothing about discriminatory fraud or its sources.

To better separate individual and firm-level effects, we analyzed a select group of inspectors who switch

Figure 2 Discrimination Measures for 86 Switchers at Two Facilities



facilities at some point during our time period. We are ultimately interested in whether levels of discrimination are correlated across multiple jobs for a single inspector, which would indicate persistent individual behavior independent of facility. We are further limited by the necessity of large numbers of observations to precisely identify fixed effects, as in our previous specification. Although previously we used only those inspectors with at least 3,500 observations, here we had to use only those inspectors with at least 1,000 observations at *each* facility, which limits us to only 86 individuals and less precisely estimates fixed effects due to significantly fewer observations. Using the same fixed effects probit model as before, we estimated segment-specific fixed effects for each of an inspector’s two jobs. For the two facilities k and l , inspector i has two luxury fixed effects, θ_{ik} and θ_{il} , and two standard fixed effects, φ_{ik} and φ_{il} , respectively. Similar to before, we calculated an inspector’s preferential treatment toward standard car customers at facilities k and l by calculating $\theta_{ik} - \varphi_{ik}$ and $\theta_{il} - \varphi_{il}$, respectively.

These two job-specific values of discrimination are plotted for each inspector in Figure 2 alongside a linear prediction of the relationship between the two jobs. Each point on this scatter plot represents one of the 86 inspectors. These discrimination values are positively correlated ($\rho = 0.28$, $p < 0.01$), suggesting that inspector-specific discrimination is correlated across jobs. Although this result in no way identifies relative levels of firm versus individual influence in discriminatory leniency, it strongly suggests that many individuals consistently discriminate across multiple jobs.

Income and Discrimination

As we discussed earlier, facilities have strong incentives to help core customers who are local to the facility area. Thus, we might expect facilities in wealthy areas to encourage their inspectors to help wealthy customers. In other words, we might expect higher average

Table 5 Median Household Income by Inspector Bias

	$p < 0.05$	$p < 0.01$		$p < 0.05$	$p < 0.01$
Robin Hoods			Luxury helpers		
Obs.	28	18	Obs.	24	8
Mean income	41,314	44,035	Mean income	59,705	65,572
Others			Others		
Obs.	212	222	Obs.	216	239
Mean income	49,759	49,158	Mean Income	48,004	48,195
T-test			T-test		
Income diff.	-8,445	-5,123	Income diff.	11,701	17,377
P(RH > O)	0.06	0.34	p(LH < O)	0.01	0.03

Note. RH, Robin Hoods; O, others; LH, luxury helpers.

incomes in the census tracts associated with inspectors favoring luxury cars than in other inspectors' areas. Similarly, we might expect inspectors who discriminate in favor of standard vehicles to work in lower-income geographic areas. To address this possibility, we examined whether or not the income demographics of facility census tracts are correlated with discrimination. Table 5 presents mean household income for the census tracts of Robin Hood and luxury helper inspectors. We compared means using inspectors identified as discriminators at both the 1% and 5% levels, with several inspectors necessarily dropped due to lack of census data. Both columns in Table 5 are consistent with our expectations for luxury helpers and significant at the 5% level. Results for Robin Hoods are directionally consistent with the customer-base explanation but not statistically significant. Those inspectors who discriminated in favor of luxury vehicles worked in census tracts with incomes of \$59,705, significantly higher than the average of \$48,004 for the rest of the sample ($p = 0.01$). This effect is even stronger for the eight luxury helpers identified at the 1% level for which we had income data, with an income difference of \$17,377. These results, which show that luxury helpers work in much wealthier areas, strongly suggest that facility profit incentives based in their customer base may explain our observations of luxury-helping inspectors. Income differences from the census tracts of Robin Hoods are also consistent with this explanation, but this relationship is much smaller and only marginally significant in one of two groups. Given that standard cars are common in all but the wealthiest areas, observing Robin Hoods in middle-income areas is not surprising.

Study 2: Experimental Study

Using data from the vehicle emissions testing market, we were able to show that for a significant number of inspectors, fraud rates are much higher for those customers owning standard vehicles versus those with luxury cars. Although providing strong evidence that employees' decisions to illegally help customers are influenced by their perception of customer wealth, the field data do not allow us to identify the economic

and psychological mechanisms behind this discriminatory fraud. We addressed this concern by designing a laboratory experiment in which we examine how envy and empathy influence individuals' likelihood to illegally help peers. The laboratory study, although having less external validity than field data, allows us to not only manipulate and measure participants' emotions, but also identify their role in ultimately driving discriminatory illegal behavior. We designed the study to be similar to our field setting on several dimensions: (1) participants are asked about illegally helping someone with their car, (2) the car owner has either a luxury or standard car, (3) the probability of getting caught is low and cost of the activity is shared across a broader population.

Methods

Participants. Three hundred and thirty-four individuals (53% male; mean age = 23, SD = 4.2) participated in exchange for \$5. Most participants (93%) were students from local universities. There were 167 participants of Asian ethnicity, 123 were Caucasian (white), and the remaining 44 were either African American or Hispanic.¹⁵ Participants were recruited using ads in which they were offered money to participate in a short experiment on decision making. In the ads, participants were told that the experiment consisted in a survey they would have to fill out and that the study would take about 20 minutes.

Procedure. The study employed a 2 (*car type*: standard versus luxury) \times 2 (*driver's gender*: female versus male) \times 2 (*driver's ethnicity*: white versus Asian) design. We manipulated driver's gender and ethnicity in addition to car type to examine whether similarities based on gender and ethnicity could account for part of the wealth-based discrimination demonstrated in our first study. It is safe to assume that students are "poor" compared to Andy (described in the scenario below) in the luxury car condition, and that Andy's wealth was a salient reference for comparison. However, by manipulating Andy's gender and ethnicity, we can also test for *same gender* and *same race* effects. For ethnicity, we only included white and Asian because these two categories represent over 80% of the subject pool from which participants were recruited. In addition, we used two types of cars for both luxury and standard conditions.¹⁶ At the beginning of the study, participants were randomly assigned to one of eight experimental conditions. In each condition, participants read a scenario and then answered questions about it. The scenario described the following situation:

Imagine that you are walking to school and you are crossing the street in front of the parking lot. You usually drive to school but decided to walk today since the sun is out. While you are passing by the school parking lot, a classmate calls your name. Your classmate, Andy,¹⁷ is in a hurry and is having problems finding a parking spot.

He asks if he can borrow your parking pass for the day so he can avoid getting a ticket, even though it's against university policy to do so. You know you would get the pass back when you see him at class tonight.

To make it easier for participants to imagine the situation described, we provided photos of the person asking for help (in a neutral facial expression) and of their vehicle. We manipulated the driver's gender and ethnicity by randomly assigning Andy's picture using photos from the Japanese and Caucasian Facial Expressions of Emotion (JACFEE) expressions (Matsumoto and Ekman 1988). The study was designed to simulate a scenario similar to the emissions testing market on as many dimensions as possible. Consequently, the study involved individuals making decisions to violate legal rules to help someone in a car-related activity. We chose the parking scenario because of its saliency to the student participants and the relatively equivalent perceived social cost of illegal parking to a fraudulent emissions test.

After reading each scenario, participants were asked to answer seven questions. The first question asked, "How likely is it you would give Andy your parking pass?" (answers could range from 1 for not likely at all to 7 for very likely). The second question inquired, "Suppose Andy was willing to give you some money for using your parking pass for the day. What is the minimal amount of money you would accept to help Andy out (in dollars)?" The third and fourth questions asked participants to indicate how much they liked Andy's car using a seven-point scale (ranging from 1 for not at all to 7 for very much) and their beliefs on the car's worth. The fifth question asked, "How envious are you of your classmate for owning this car?" (answers could range from 1 for not envious at all to 7 for very envious). The sixth question stated, "Imagine you decided not to help out your classmate. How sorry do you think you would be if you later found out Andy got a parking ticket?" (answers could range from 1 for not sorry at all to 7 for very sorry). Finally, the last question asked participants to indicate the extent to which they thought Andy engaged in unethical behavior when asking them to borrow their parking pass (answers could range from 1 for not at all unethical to 7 for very unethical). As their final task, participants answered a demographic questionnaire.

Results

Our hypotheses predict that an individual's likelihood to illicitly help others will vary based on the beneficiary's wealth, and that feelings of envy and empathy will drive much of this behavior. In the current study, similar to the emissions testing market, wealth is represented by the type of car Andy is driving. We first conducted analyses including participants' *gender*, *age*, *occupational status* (i.e., student versus not), and *ethnicity* as independent

variables. We found no main effects or interaction effects for any of these demographics, and we thus report our results collapsed across demographic groups. The only exception was the significant effect of men being more willing to help female others than male others.

Manipulation Check. We used several tests to verify that participants perceived value and desirability differences between our vehicle photos. We first subjected participants' vehicle liking ratings to an analysis of variance (ANOVA) in which *car type* (luxury versus standard), *driver's gender* (female versus male) and *driver's ethnicity* (Asian versus white) served as between-subjects factors. Participants reported liking Andy's car more when it was luxury (mean = 5.41, SD = 1.43) than when it was standard (mean = 3.53, SD = 1.39; $F(1, 326) = 152, p < 0.001, \eta^2 = 0.32$). The implementation of an ordered probit model did not change the nature and significance of the results, with luxury car status increasing liking ratings by an average of 1.34 ($p < 0.001$). We also tested participants' *car value beliefs* as the dependent variable in a similar ANOVA. Participants thought Andy's car was worth more when it was luxury (mean = \$36,780, SD = \$19,993) than when it was standard (mean = \$10,584, SD = \$6,922; $F(1, 323) = 255, p < 0.001, \eta^2 = 0.44$). Finally, we found no differences in measures of unethicality across conditions, with participants assigning average unethicality ratings of 3.35 for standard cars and 3.51 for luxury cars. These results also suggest that participants considered lending the parking pass mildly to moderately unethical, despite the local universities having clear policies qualifying lending a parking pass as illegal.

Likelihood of Lending Andy a Parking Pass. We used the seven-point likelihood scale as the dependent variable in a 2 (*car type*) \times 2 (*driver's gender*) \times 2 (*driver's ethnicity*) between-subjects ANOVA. This analysis revealed that participants were more likely to give Andy their own parking pass when Andy's car was standard (mean = 5.57, SD = 1.41) than when it was luxury (mean = 4.70, SD = 2.02; $F(1, 326) = 21.73, p < 0.001, \eta^2 = 0.06$). In addition, participants were more likely to give Andy their own parking pass when Andy was female (mean = 5.31, SD = 1.73) than when Andy was male (mean = 4.91, SD = 1.87; $F(1, 326) = 4.05, p < 0.05, \eta^2 = 0.01$). We found no other significant results.

We conducted a similar analysis including control variables for *same gender* and *same race* effects. This analysis revealed a significant main effect for *car type* in the predicted direction ($F(1, 319) = 22.73, p < 0.001, \eta^2 = 0.07$). The effect of Andy's gender was also significant, but only marginally ($F(1, 319) = 3.28, p = 0.07, \eta^2 = 0.01$). Instead, both the effects of *same gender* ($p = 0.51$) and *same race* ($p = 0.88$) were insignificant. We found no other significant results.

Robustness Checks. The use of Likert items as dependent variables in ANOVA analyses presents some specification problems. ANOVA relies on the assumption of a normal distribution of error terms, an assumption often violated by Likert items that are both discrete and censored on both sides. Although in some cases Likert items may approximate normal distributions, and thereby produce approximately normal residuals, in other cases they may appear bimodal as respondents tend toward extreme answers or may have means at extreme values. Such distributions produce errors in ANOVA that violate normality assumptions. Consequently, we alternatively use an ordered probit model to test whether a luxury car reduces the willingness to help Andy by lending him or her a parking pass. The results support the ANOVA analysis, with luxury vehicles on average reducing the willingness to help by 47 points ($p < 0.001$). The estimated effect is much larger for lower levels of willingness, with changes from 1 to 2 and 2 to 3 producing coefficients of -1.67 and -1.36 , respectively. Taken together, these results provide support for our first hypothesis, which predicted that individuals would be less likely to help others when they perceived these others to be wealthy than if they perceived them to be earning a lower income.

Minimum Amount of Money. We used the *minimum amount of money* participants would accept to help Andy as the dependent variable in a 2 (*car type*) \times 2 (*driver's gender*) \times 2 (*driver's ethnicity*) between-subjects ANOVA. Participants were willing to help Andy in exchange for a larger amount of money when Andy's car was luxury (mean = 8.83, SD = 11.86) than when it was standard (mean = 4.60, SD = 6.04; $F(1, 324) = 17.39$, $p < 0.001$, $\eta^2 = 0.05$). In addition, participants asked for a lower amount when Andy was female (mean = 5.58, SD = 8.01) than when Andy was male (mean = 8.16, SD = 11.22; $F(1, 324) = 5.84$, $p = 0.016$, $\eta^2 = 0.02$). We found no other significant results.

We conducted a similar analysis including control variables for *same gender* and *same race* effects. The main effect for *car type* was significant and in the predicted direction ($F(1, 317) = 16.33$, $p < 0.001$, $\eta^2 = 0.05$). As before, the effect of Andy's gender was also significant ($F(1, 317) = 5.82$, $p < 0.05$, $\eta^2 = 0.02$). Instead, both the effects of *same gender* ($p = 0.48$) and *same race* ($p = 0.13$) were insignificant. We found no other significant results.

Empathy. In our next set of analyses, we examined the effect of our manipulations on feelings of empathy and envy toward Andy. Indeed, we wanted to make sure our manipulations influenced emotional reactions resulting from social comparisons based on wealth (operationalized as the car Andy drives) as well as gender and ethnicity. Our sixth question asked participants to indicate how sorry they would feel if they later discovered Andy received a parking ticket, thus providing a measure

for participants' empathy toward Andy. Feelings such as compassion, tenderness, and sympathy characterize emphatic concern toward others (Cialdini et al. 1997). We used this empathy measure in an ANOVA with *car type*, *driver's gender*, and *driver's ethnicity* as between-subjects factors. Participants reported feeling more sorry when Andy's car was standard (mean = 4.82, SD = 1.85) than when it was luxury (mean = 4.06, SD = 2.12; $F(1, 326) = 12.04$, $p = 0.001$, $\eta^2 = 0.04$). Furthermore, participants reported feeling more sorry when Andy was female (mean = 4.66, SD = 1.93) than when Andy was male (mean = 4.17, SD = 2.10; $F(1, 326) = 5.11$, $p < 0.05$, $\eta^2 = 0.02$). We found no other significant effect. An ordered probit modeling how car type influenced feelings of empathy produced consistent results. These findings show that luxury cars lowered empathy by an average of 41 points ($p < 0.001$). Taken together, these results demonstrate that participants experienced stronger feelings of empathy toward lower-income others compared with wealthy peers.

We conducted a similar analysis including control variables for *same gender* and *same race* effects. The main effect for *car type* was again significant and in the predicted direction ($F(1, 319) = 13.05$, $p < 0.001$, $\eta^2 = 0.04$). As before, the effect of Andy's gender was also significant ($F(1, 319) = 5.80$, $p < 0.05$, $\eta^2 = 0.02$). The effect of *same gender* did not reach statistical significance ($p = 0.12$), whereas the effect of *same race* did ($F(1, 319) = 5.81$, $p < 0.05$, $\eta^2 = 0.02$). Participants reported feeling more sorry when Andy was of the same race (mean = 4.63, SD = 1.92) than when he was not (mean = 4.14, SD = 2.15). We found no other significant results.

Envy. We used the envy ratings in a similar ANOVA. Participants reported feeling more envy toward Andy when Andy's car was luxury (mean = 3.54, SD = 2.05) than when it was standard (mean = 2.14, SD = 1.29; $F(1, 326) = 54.16$, $p < 0.001$, $\eta^2 = 0.14$). We found no other significant effect. Consistent with these results, an ordered probit modeling how car type influenced envy revealed that luxury cars increase envy by an average of 82 points ($p < 0.001$). Taken together, these results demonstrate that participants experienced stronger feelings of envy toward wealthy others compared to lower-income peers.

We conducted a similar analysis including control variables for *same gender* and *same race* effects. The main effect for *car type* was significant and in the predicted direction ($F(1, 319) = 52.06$, $p < 0.001$, $\eta^2 = 0.14$). Instead, both the effect of *same gender* ($p = 0.79$) and *same race* ($p = 0.57$) were insignificant. We found no other significant results.

Mediation Analyses. In our final set of analyses, we tested whether feelings of envy and empathy mediate the

relationship between car type and participants' willingness to help Andy, which would suggest that envy and empathy are primary factors in explaining the influence of perceived wealth on illegal behavior. We tested this relationship using the criteria prescribed by Baron and Kenny (1986) while using bootstrapping corrections to address the nonnormality of the data (Efron and Tibshirani 1986, Shrout and Bolger 2002).¹⁸ In all regressions, we controlled for Andy's *gender* and *race*, as well as whether participants were of the *same gender* or *race* as Andy. In our first regression, we used *car type* as the independent variable (1 = luxury, 0 = standard) and the *likelihood of giving one's own parking pass* as the dependent variable. As expected, this relationship was significant and negative ($\beta = -0.88, p < 0.001$). In the second regression, we tested the relationship between *car type* and feelings of *envy*. This relationship was significant and positive ($\beta = 1.39, p < 0.001$), indicating that those in the luxury car condition reported feeling more envy toward Andy than those in the standard car condition. We then tested the relationship between *car type* and *empathy*. This relationship was significant and negative ($\beta = -0.79, p < 0.001$), indicating that those in the luxury car condition reported feeling less empathy toward Andy than those in the standard car condition. In the final step, we included *car type* and both *envy* and *empathy* as independent variables and *likelihood of giving one's own parking pass* as the dependent variable. Supporting our mediation hypothesis ($\Delta R^2 = 0.25, p < 0.001$), the path between *car type* and *likelihood of helping Andy* became insignificant ($\beta = -0.21, p = 0.20$) when the direct influences of *envy* ($\beta = -0.29, p < 0.001$) and *empathy* ($\beta = 0.35, p < 0.001$) were included in the regression. These results provide support for Hypotheses 2 and 3. Consistent with Hypothesis 4, these results suggest that feelings of envy and empathy fully mediate the relationship between car type (as a measure of perceived wealth) and the likelihood of helping others engage in illegal behavior. We summarize the mediation results in Table 6. These results were unaffected by the inclusion of *same gender* and *same race* as additional independent variables.

General Discussion

In the context of emissions testing, a striking number of inspectors treated standard vehicles differently than luxury cars. Although financial considerations appeared to lead some inspectors to help luxury cars but not standard vehicles pass tests, the majority of discriminators appeared to be illegally helping customers who exhibited less wealth. This discrimination bias is consistent with what we might expect from a profession with a low average income. A laboratory study allowed us to investigate the psychological drivers of the demonstrated wealth-based discrimination, showing that individuals are more

Table 6 Mediation Analyses, Study 2

	Dependent variables			F	R ²	ΔR^2
	Envy β	Empathy β	Helping β			
Mediation analysis, Step 1						
Luxury car			-0.88***	5.60***	0.079	
Same gender			-0.11			
Male driver			-0.40*			
Same race			0.04			
Asian driver			-0.30			
Mediation analysis, Step 2a						
Luxury car	1.39***			10.82***	0.142	
Same gender	-0.07					
Male driver	0.07					
Same race	-0.16					
Asian driver	0.02					
Mediation analysis, Step 2b						
Luxury car		-0.79***		5.66***	0.080	
Same gender		-0.31				
Male driver		-0.50*				
Same race		0.60**				
Asian driver		-0.28				
Mediation analysis, Step 3						
Luxury car			-0.21	22.59***	0.327	0.248***
Same gender			-0.02			
Male driver			-0.21			
Same race			-0.17			
Asian driver			-0.21			
Envy			-0.29***			
Empathy			0.35***			

Notes. Each model uses OLS regressions with bootstrapped errors. The table reports unstandardized coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

likely to illegally help peers with standard rather than luxury cars due to feelings of envy and empathy.

Identifying the influences of envy and empathy on the observed wealth-based discrimination in emissions testing is infeasible. Although we observe systematic differences in relative pass rates, we cannot identify exact levels of illegal behavior in this market for two reasons. First, although leniency in this market is widely accomplished through illicit behavior, we cannot guarantee that each case reflects this fraud. Second, given the prevalence of fraudulent passing in emissions testing, it is safe to say that fixed effects of zero, where an inspector's pass rate is perfectly predicted by the composition of her portfolio, represent average levels of cheating in the market, and thus some degree of fraud. Given that conclusion, we can safely assert that our Robin Hood inspectors are fraudulently helping standard vehicles pass, given their strongly positive coefficients in Table 4. We are less confident, however, in interpreting coefficients for these inspectors' luxury car fixed effects. Although we can confidently say that these effects are lower than standard car fixed effects, we cannot identify them as representing the "no cheating," "less helping," or

“sabotaging” categories. A luxury fixed effect of -0.02 , for example, may reflect 2% below the average pass rate, but may still be *above* the expected pass rate under strictly legal testing. As noted earlier, we must limit our conclusions in this paper to discriminatory levels of illicit helping behavior, one-half of the “Robin Hood effect.” We acknowledge, however, that many of these Robin Hoods are likely intentionally failing luxury car owners, given luxury fixed effects less than -0.05 .

We are also cautious in concluding how much of the demonstrated wealth-based discrimination is consciously motivated and how much is implicit. Psychology research on implicit biases in ethics (Bazerman and Banaji 2004), as well as the conclusions drawn from race-based bias in sports (Price and Wolfers 2007), suggest that at least some of the behavior we observed may be subconscious rather than strategically motivated. Yet the choice of the inspector to commit fraud is discrete and consciously inescapable. Consequently, we believe that inspectors are aware of their behavior when fraudulently passing cars. We are unable to positively assert, however, that they are consciously aware of their discrimination in this behavior nor that they find fraudulent help inherently unethical.

We believe that our primary result, that 11% (27 out of 249) of inspectors show statistically significant discrimination at the 1% level, is an important one, because it suggests that perceived customer wealth can influence employees’ illegal behavior. Furthermore, linking these results with census tract income data suggests that the average income level in an inspector’s area partially explains discrimination favoring luxury car owners, suggesting that firm-based financial interests may play an additional role in discriminatory fraud. Results from our laboratory study strengthen these findings and suggest that envy and empathy may be driving the discriminatory fraud that we observe. Specific demographic information on inspectors and vehicle owners would better pin down the psychological processes driving the discrimination, but these data have been, to this point, impossible to acquire.

The results of our laboratory study also demonstrate that race and gender, commonly thought to be major drivers of empathy, had little effect on dishonest helping. We are cautious in putting too much weight on the nonresult of race, because the demographics of our participant population allowed only for comparisons based on white and Asian individuals. Given evidence from the economics literature (Price and Wolfers 2008, Bertrand and Mullainathan 2004, Parsons et al. 2007), we may have found very different results with an African American photograph and a sufficient sample of African American participants. Similarly, demographic information on vehicle owners and inspectors in Study 1 may have shown race to be an additional important influence of discriminatory fraud.

Theoretical and Practical Implications

This paper contributes to the literatures on corruption, discrimination, and ethics in two important ways. First, our work explains how the social condition of others can provide an important context for ethical decision making. Individuals appear to be influenced by social comparisons when choosing to engage in illicit behavior. These social comparisons between employees and customers can lead to discriminatory and often illegal behavior based on customer income. Second, this paper provides a unique combination of laboratory and market transaction data to identify how envy and empathy might influence decisions in actual employee–customer relations. The existing empirical evidence on the behavioral results of envy and empathy consists primarily of laboratory experiments, a methodology that benefits from precise targeting of behavioral mechanisms yet suffers from questions of applicability to true organizational and market settings. Our methodological pairing utilizes the microanalytic benefits of the lab while showing its application to firm and market settings.

The present work also has important implications for managers by showing that the allocation of employees to customers with whom they interact can directly influence fraud and other unethical behaviors. Employee emotional reactions to customer wealth may lead them to take actions that are costly to the organization, unfair, and explicitly illegal. Allegations of race-based discrimination in professional basketball (Price and Wolfers 2007) have highlighted the threat that such behavior poses to profitability, leading professional sports leagues to implement careful referee monitoring systems. Similar race-based findings in resume evaluation (Bertrand and Mullainathan 2004) suggest that employees who impose personal preferences on the firm may lead to costly suboptimal human resource decisions. Our findings suggest that wealth-based comparisons between employees and customers may present similar problems for firms. If employees have discretion to help or hurt those customers for whom they feel envy or empathy, managers must implement safeguards to prevent behavior deleterious to the firm profitability. These safeguards could include training on how emotions influence judgment as well as staffing decisions that limit the occurrence of employee–customer dyads likely to produce such emotions. When anticipating such discriminatory behavior, managers can also reduce discretion by requiring teams of diverse individuals to provide redundant approval of such decisions, or can increase managerial monitoring. Finally, statistical analysis of individual employee behavior, such as in this paper, has potential to reveal patterns of suspect behavior hidden behind a veil of secrecy.

Limitations and Directions for Future Research

The present research must be qualified in light of various limitations, which offer valuable ideas for future

research. One limitation is that we cannot observe financial transactions between customers and employees. Many of the fraudulent passing tests may involve side payments that are unobservable in the data and may provide a large level of motivation for inspectors. Our experimental work shows that the magnitude of these side payments is likely influenced by the type of car, however, and additional mediation analyses conducted on data from Study 2 (not reported) show that envy and empathy fully mediate this effect. This suggests to us that although customer wealth may influence the magnitude and frequency of side payments, some of this effect is explained by social comparison processes. We should also note that, as mentioned earlier, our data set includes vehicles owned by individuals, corporations, fleets, and government agencies, yet we are unable to distinguish among these owners. In our hypotheses, we refer specifically to comparisons between individuals and not comparisons between individuals and organizations, so we cannot observe how organizational ownership influences this result. Future research addressing these issues could provide additional evidence on wealth-based discrimination and strengthen the contribution of the present work.

Another limitation of our research is the focus on empathy and envy as the main mechanisms explaining the demonstrated wealth-based discrimination. In our settings, wealth-based comparisons were likely to be particularly salient in social comparison processes, and, as we argued, disparity in wealth evoked strong emotional reactions in the perpetrator. Future research could investigate the presence of wealth-based discrimination in contexts other than employee–customer relations, such as settings in which wealth cues are provided by other possessions (rather than a car) or by the presence of cash. By using different measures of wealth, future research could strengthen and validate the results presented here.

Future research could also investigate other factors that might explain the type of wealth-based discrimination observed in our research. One potentially interesting candidate for further studies is interpersonal liking. Prior research has suggested that both empathy and helping are increased by interpersonal liking and rapport (Bartol 1976). Both empathy and envy may lead to different levels of liking, which in turn could lead to dishonest helping. This hypothesis suggests another level of mediation not measured in the present research that further studies could explore.

In addition, future research could use different measures for emotional reactions. Study 2 assessed empathy by asking participants “how sorry” they would feel if Andy received a parking ticket. Although this measure is related to a feeling of compassion, it is confounded with perceived wealth and does not directly capture feelings of empathy toward a referent other. In addition, the question used to measure empathy in our study came after

a question measuring envy, which asked participants to indicate how envious they were of their classmate for owning the car observed in the photograph. This question may have drawn participants’ attention to the type of car their classmate owned and thus primed responses on the following question measuring envy.

People are likely to engage in unethical behavior if the benefits of cheating exceed the costs (Hechter 1990, Lewicki 1984), using an implicit cost–benefit analysis when confronted with the decision of whether or not to behave unethically. The benefits are represented by the rewards individuals gain through their dishonest acts, whereas the costs are represented by the probability of detection and severity of punishment. Consistent with this view, several studies have shown that unethical behavior is inversely related to both the risk of being caught (Hill and Kochendorfer 1969, Leming 1980, Tittle and Rowe 1973) and the severity of the punishment (Michaels and Miethe 1989). In our research settings, the probability of detection is low; thus, it is not surprising to find such widespread illicit behavior. Future research could investigate whether wealth-based discrimination persists even when the probability of detection is high and the severity of the punishment considerable.

Finally, future research could further explore the effects of similarity in income levels on illicit helping behavior. In our studies, customers (field study) or peers (laboratory study) were wealthy enough to own a car, and we assumed inspectors or peers to have a similar level of income. Further work could examine whether the effects demonstrated here would hold when both parties in the employee–customer or peer–peer relationships are very poor or are very wealthy.

Conclusion

Both social comparison and unethical practices are widespread behaviors within organizations and broader society. This paper shows that social comparison can lead to illegal customer-based discrimination by employees. Employees’ likelihood to engage in fraud appears to depend on the perceived wealth of customers, a natural basis for social comparison. This discrimination likely results from a combination of envy and empathy, with employees helping customers with whom they empathize and either refusing to help or sabotaging those they envy.

Our findings are similar to the behavior that Price and Wolfers (2007) and Parsons et al. (2007) found among referees and umpires of sporting events; namely, employees tend to treat those who are like them differently. Their work, along with a large literature on discrimination, shows the importance of monitoring employee behavior for race- and gender-based bias. This paper highlights the relevance of a less-investigated

factor in discrimination: the perceived wealth of others. Our findings suggest that managers should monitor their employees not only for discrimination based on race, gender, religion, or sexual orientation, but also for wealth-based discrimination that may be both illegal and costly to the firm.

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Endnotes

¹Statistics are from the Coalition Against Insurance Fraud at <http://www.cops.usdoj.gov>.

²It is important to distinguish between two types of behaviors: illegal and unethical behaviors. Illegal, or unlawful, behaviors are acts that are prohibited or not authorized by law or, more generally, by rules specific to a particular situation (such as a game). Unethical behaviors, instead, are "either illegal or morally unacceptable to the larger community" (Jones 1991, p. 367). As these definitions suggest, unethical acts are not necessarily illegal, and illegal acts are not necessarily perceived as unethical. This paper focuses on illegal behaviors. In our studies, these behaviors take the form of helping others by passing an emissions test that they would otherwise fail (Study 1) or helping others by lending them a parking pass so that they can avoid a parking ticket they would otherwise get (Study 2).

³Throughout this paper, we use the terms "standard cars" and "luxury cars" to distinguish between two distinct segments in the vehicle market that might signal two different levels of wealth. Table 1 reports the car makes that were coded as either standard or luxury in our data set. Note that in the present research the term "standard car" is not used to refer to cars with manual (or stick shift) transmissions.

⁴If a driver has a registered vehicle that weighs less than 8,500 pounds, she must have it tested regularly for the presence of hydrocarbons, carbon monoxide, and nitrogen oxide. If someone's car is newer than 1981, she must choose a testing station at which to conduct the test. These testing facilities are typically private companies licensed by the state to perform emissions testing, although testing is entirely state-run in some states.

⁵Data are from CNW Marketing Research, Inc., in Bandon, Oregon, a private market research company in automobiles that was founded in 1984.

⁶Five cars were luxury cars (Cadillac XLR, Lexus LS 460, Mercedes ML-Class, Acura RL, and BMW 335 Coupe) and five were standard cars (Chevrolet Silverado, Volkswagen Passat, Toyota Highlander, Ford Focus, and Honda Accord). All the models used in the stimuli were 2007 cars.

⁷We alternatively used a linear probability model with an OLS specification to avoid dropping perfectly predicted groups. Whereas these results were generally consistent with the probit model, bootstrapped simulations showed the OLS model

to produce highly biased standard errors, due to the data's violation of OLS assumptions on independent identically distributed errors.

⁸We were forced to drop 10 inspectors who passed all cars due to probit specification.

⁹Our sample of 249 of the largest inspectors is considerably smaller than our population of 18,763 inspectors, whose mean of 529 inspections falls well below our 3,500 inspection threshold. The low average inspection count stems from inspectors doing other work, including service, safety testing, and repairs.

¹⁰We had previously observed the potentially severe effects of misspecification in running OLS models, which identified nearly half of all inspectors as statistically significant, and which simulations proved to be greatly miscalculating standard errors.

¹¹These simulations were repeated 33 times with replacement.

¹²See Efron and Tibshirani (1986) for an extensive discussion of bootstrapping techniques.

¹³See Abrams and Yoon (2007) or Pierce and Snyder (2008) for other applications of this technique.

¹⁴Please note that the inspectors in the real and simulated probit models are not identical. Inspectors with 100% pass rates on luxury vehicles were dropped, and those conditions are not identical in the real and simulated data.

¹⁵Note that the nature and significance of our results did not change when considering only white and Asian participants (thus eliminating the 44 participants who were either African American or Hispanic).

¹⁶The luxury cars were a 2002 Lexus LS 460 and a 2007 BMW 335 Coupe. The standard cars were a 1997 Honda Accord and a 2002 Ford Focus. These cars were consistent with our luxury/standard designations in the emissions testing study.

¹⁷The name "Andy" was used for conditions of both male and female classmates, because it is a gender-neutral name. The gender of pronouns was changed accordingly.

¹⁸We used 100,000 repetitions in our bootstrapping procedure.

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