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An Investigation of Motorists' Perceptions of Trucks on the Highways

Abstract

The logistic activity most visible to the general population is the presence of trucks transporting goods across the nation's highways. Transportation also represents the largest portion of total logistics costs and a large percentage of the problems. At times, these problems arise in the form of accidents, even tragedies, as trucks collide with automobiles. Car-truck accidents, though expensive, are an unfortunate cost of doing business and motorists' behaviors are out of the control of the transportation manager. Recently, the federal government and private industry have attempted to educate motorists concerning dangerous spots around trucks. Programs such as the Share the Road campaign, though mildly successful at directing behaviors of motorists near trucks, do not address motorists' perceptions of trucks—which may determine how they behave around the larger vehicles. This article is one of the first that directly examines motorists' perceptions of trucks on the highway and the effect these perceptions have on support for stricter safety regulation of the trucking industry. Based on a national random sample of U.S. motorists, these results suggest that the general U.S. driving population's perception of trucks is predominately negative, and these perceptions are significant predictors of support for stricter truck speed regulation.

While reports from the National Highway Traffic Safety Administration show that highway accidents and fatalities involving trucks are decreasing over time (2002), daily, newspapers and news programs remind us that accidents involving trucks are often dramatic and unforgiving. Catastrophic truck accidents have long raised concerns regarding truck safety with both policymakers and the general public. McKinnon (1999) and Boughton (2003) have noted that the costs of road transport associated with accidents have been escalating. Aside from the direct costs to the transporter involved in the accident, additional costs are inflicted on non-involved transporters' time, fuel, and labor as vehicles negotiate delays, detours, and congestion. For example, the Connecticut portion of Interstate 95 carries approximately 120,000 vehicles and $330 million in freight every day (Reitz 2004), but on the evening of March 25, 2004, a tanker truck carrying 12,000 gallons of fuel oil collided with a car on a bridge in Bridgeport, Connecticut. The ensuing blast and fire melted the supports for the bridge, resulting in the complete closure of the heavily

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used interstate for several days. The detours caused by the accident resulted in gridlock. The costs from police overtime and the emergency construction of a temporary bridge are estimated at over $10 million (Reitz 2004). Though speed was not cited as a specific factor in this accident, a total of ten states nationwide fear such catastrophic accidents and have instituted regulations mandating lower speed limits for trucks than cars on their highways (Siegel 2004).

For the logistics community, the most visible aspect of their activities to consumers is the presence of trucks transporting goods across the highways and byways of the land. How motorists view trucks forms part of the general public's overall attitude toward the transportation industry and logistics community in general. More importantly, how motorists perceive trucks is likely to affect their behavior near trucks on the highways. Understanding these perceptions may save lives and reduce logistics costs from property damage and insurance premiums. Of these costs, insurance premiums have seen increases of over 150 percent during the past few years primarily because of increases in claims against trucking firms (Proctor 2002).

In specific response to highway safety concerns, the trucking industry and federal agencies have instituted safety campaigns aimed at truckers and the general public. Safety programs directed at the general public have been in the form of education programs, such as the *Share The Road-No Zone* (Longo 1999) campaign, which informs motorists about certain areas around a truck where the truck driver cannot see motorists. Though these programs can help direct the behavior of motorists around trucks in traffic, they are not designed to influence motorists' perceptions and beliefs about trucks.

Perceptions and beliefs about trucks on the highway are likely to be formed by the motorist's experiences and personal characteristics, such as sensation seeking and risk taking propensity (Sümer 2003). To educate and train motorists effectively to drive safely around trucks, we must first understand motorists' perceptions and driving experiences. Thus, the focus of this article is to examine the relationship between motorists' driving experiences, driving behavior, and perceptions and beliefs about trucks on the highway. These relationships are important in that they can help policy makers increase road safety through educational intervention.

Background Literature

The importance of how motorists perceive trucks on the highway stems chiefly from what Carter and Jennings (2002) termed Logistics Social Responsibility (LSR). Carter and Jennings suggest that a stewardship approach can be helpful in examining LSR. A stewardship framework suggests that the interests of all stakeholders (e.g., suppliers, manufacturers, distributors, the local community) have value and no set of interests is more important than any other (Clarkson 1995). The use of a stewardship approach is evident in LSR, as industry attention has been focused on areas such as the environmental impact of trucks and the institution of highway safety programs (Murphy and Daley 1990). Of particular interest in this investigation is the research concerning truck safety.

For the most part, logisticians and regulators have exhibited a within-industry prescriptive approach when confronting the issue of truck safety. Historically, logistics researchers have investigated the antecedents of safety for motor carriers from the carrier's perspective (e.g., Bruning 1989; Hanowski et al. 1999; Mejza and Corsi 1999; Mejza et al. 2003) and regulations that most effectively promote safety (Phillips and McCutchen 1991). Overall findings indicate that the motor carrier's organizational culture toward safe driving is an important predictor of the safety record for the firm (Arboleda et al. 2003; Corsi et al. 1988; Mejza et al. 2003).

Motorists' Behavior Near Large Trucks

Recent research funded by the U.S. Department of Transportation has begun to examine the behaviors of motorists in the presence of trucks and these motorists' contributions to accidents. The U.S. Department of Transportation (Stuster 1999) produced a report titled "The Unsafe Driving Acts of Motorists in the Vicinity of Large Trucks" in an effort to determine the risky behavior of motorists near trucks. The report notes a list of twenty-seven

motorists' behaviors that resulted in truck-auto crashes. Among the top causes of accidents were (1) illegal behavior of motorists (i.e., speeding, tailgating); and (2) motorists' distractions (i.e., talking on the phone, reading). In addition, the report attempted to determine why motorists engaged in these behaviors. Truck drivers and experts perceived that the reasons for the motorists' behavior included aggression, inattentiveness, incompetence, and ignorance. Similarly, in a series of eleven separate focus groups with local short-haul truck drivers, Hanowski et al. (1999) found that the number-one critical issue associated with general safety issues was motorists' negative attitude toward trucks and a general lack of respect for trucks on the highway.

Determinants of Motorists' Behavior

Direct examinations concerning the reasons why motorists behave as they do on the roadways has been explored extensively in safety and accident analysis (e.g., Turner and McClure 2003). Researchers have investigated the causal effect of factors such as age, gender (e.g., Assum 1997), personality (e.g., Lawton et al. 1997), and behavior (e.g., Smith et al. 2004) in traffic accidents.

Turner and McClure (2003) found that risk-taking behavior (i.e., speeding, drunk driving, moving violations) in young males was a significant predictor of motor vehicle crashes. Finn and Bragg (1986) showed that young male drivers (vs. older male drivers) are overrepresented in accidents because they do not perceive specific driving situations as risky. Dejoy (1992) found that young males (as opposed to young females) overestimated their driving competency and perceived dangerous driving conditions as less risky. Assum (1997) also found that age and annual mileage were important predictors of accident risk.

In support of a gender factor in accident analysis, Parry (1968) as well as others (e.g., Blockley and Hartley 1995; Lawton et al. 1997) have found that men score higher on driver aggression measures than women, and that the aggression score decreases significantly with age. Additionally, Owsley, McGwin, and McNeal (2003) found that senior drivers who were more venturesome—that is, they drove more frequently—were less likely to be involved in accidents.

With respect to in-car risky behaviors while driving, research has shown distractions such as the use of a cell phone diverts attention away from the primary task of vehicle control and could contribute to a failure to maintain control in critical situations (Hancock, Lesch, and Simmons 2003; Patten et al. 2004). In response to how motorists view others' driving behavior on the roadways, actions such as the need to drive defensively and wearing seatbelts are seen as ways to combat dangers while driving (Williams 2003).

Research Questions

From a public policy perspective, media and education campaigns have sought to influence the driving behavior of motorists near trucks. What is lacking in our understanding, however, is how motorists perceive trucks in the first place. For this investigation, we take an approach similar to Lieb, Wiseman, and Moore's (1986; as well as Lieb and Wiseman 2001) research concerning motorists' perceptions of automobile safety issues and directly assess motorists' viewpoints. To date no research has investigated the existing perceptions that motorists have of trucks on the highway. Additionally, past research concerning accident analysis has established indicators such as age, gender, and propensity for risk taking as significant predictors of accidents. We explicitly examine whether these indicators are also associated with perceptions of truck driving behavior. Therefore:

Research Question 1: What are motorists' perceptions of trucks on the highway?

Research Question 2: Is there a relationship between established predictors of highway behavior and perceptions of trucks?

In addition to these research questions, we would also like to explore the association between motorists' perceptions of trucks and support for regulations concerning the operation of trucks on the highway. Motorists' support for strict regulation can include support for legislative actions such as lower speed limits, increasing commercial driving license requirements, and hours of service/daily mileage rules. We suggest that if motorists do have differing perceptions toward trucks, they also would be likely to have differing viewpoints concerning their regulation. Research in psychology has

long shown that perceptions are strongly associated with beliefs and behaviors (e.g., Eagly and Chaiken 1993). Therefore:

Research Question 3: Is there a relationship between perceptions of trucks and motorists' support for stricter regulations of trucks?

Methodology

In the summer of 2003, the authors were invited by the Social Science Research Center (SSRC) at Mississippi State University to provide several questions to be included in their annual national survey of drivers' attitudes and opinions. Due to SSRC's existing survey structure and length, the number and type of questions we were able to contribute was limited. We added one question that assessed truck accident experience and six questions that assessed motorists' perceptions of trucks. The items we added, as well as the data collection procedure, are discussed next.

Item Development and Selection

Because this study is one of the first to explore motorists' perceptions of trucks on the highways, the literature offered little guidance concerning what perceptions should be assessed. A review of the literature revealed items that assess either motorists' perceptions of automobile safety (e.g., Lieb and Wiseman 2001; Lieb, Wiseman, and Moore 1986), past driving behaviors (e.g., Gebers and Peck 2003), risky behavior (e.g., Turner and McClure 2003), or truck drivers' perceptions of motorists (e.g., Hanowski et al. 1999). However, no items that directly assess perceptions of trucks were evident. Therefore, six items that directly tap perceptions of trucks were constructed to reflect motorists' perceptions of truck behavior and characteristics of trucks. Additionally, the SSRC survey contained items that assessed general accident experience, but did not have a question that asked if the individual was involved in an accident with a truck. We therefore added an item that asked if the individual had been involved in an accident with a large truck.

With respect to our dependent variable for Research Question 3, the existing SSRC survey contained an item that assesses motorists' support for lower speed limit for trucks than passenger vehicles (LIMIT). This question served as our operationalization of motorists' support for stricter regulation of trucks. We also selected a number questions already contained in the SSRC survey instrument to assess motorists' driving experience and engagement in risky driving behavior. The items discussed in this analysis are presented in Appendix A.

Data Collection

A national telephone survey was used to collect responses to the complete survey. The telephone survey was conducted by the SSRC at Mississippi State University in the summer of 2003. SSRC used a random digit dialing process to contact potential respondents. Respondents were asked a number of questions concerning automobile and highway safety issues as well as the items developed by the researchers. Of the 1,508 completed interviews from the SSRC, 116 responses were eliminated because the respondent indicated they did not currently drive and subsequent driving-related variables were not asked of them, resulting in 1,392 responses. The resultant sample demographic characteristics as well as variable definitions and abbreviations, included in Appendix A, are reasonably representative of the U.S. general population in terms of age, gender, race, and income (U.S. Census Bureau 2003). Additionally, responses to the SSRC questions are similar to previous national survey results conducted by the center. The sampling error for binomial questions with a conservative 50/50 split for this data set is no more than +/- 3 percent with a 95 percent confidence.

Analyses and Results

Overall, the respondent's average age was approximately 47 years, with a range between 18 and 101 years of age. Slightly more females (60 percent) than males (39 percent) were represented in the sample than in the general population. The reported driving behavior is relatively the same as previous reports (Snow 2002), with 25 percent (vs. 23.6 percent) reported having a serious accident while driving, 9.8 percent (vs. 9.9 percent) reporting an accident in the past year, and 11 percent (vs. 13 percent) reporting having received a ticket for speeding or some other moving violation. This survey reports that in terms of driving familiarity, the vast majority of the respondents (90 percent) indicate that they drive a motor vehicle

at least once a day and 47 percent drive more than 100 miles a week.

Research Question 1: What are motorists' perceptions of trucks on the highway?

The means and frequencies for each perception are shown in Table 1 and the correlation between perceptions is provided in Table 2. For Research Question 1, we combined those who agree and strongly agree into an "agree" category. We conducted a similar grouping for those who disagree. Of the six perception variables that were assessed, three examined motorists' perception of truck driver behaviors (DANGER, FAST, and PASS), one question assessed the dangerousness of the effects of truck spray during rainstorms (WET), one question assessed an overall perception of trucks (HAZARD), and one question assessed the motorists' perception of driving near trucks (NERVOUS). The six perception variables were also factor analyzed to determine dimensionality. Analysis indicates a single factor solution accounting for 54 percent of the variance between the variables in perception of trucks.

In analysis of the individual items, the most common perception of trucks is that they create dangerous conditions by creating road spray during rainstorms. Next, the majority of our respondents felt that truck drivers go too fast and create dangerous conditions when passing other trucks. The respondents were equally divided on whether truck drivers often drive in ways that endanger passenger cars.

To compare those who agreed with those who disagreed for each of the perceptions, we next determined if there was a statistical difference between the proportion of respondents in each of these groups. Excluding the neutral respondents, we found that except for DANGER, in which there is an equal chance of agreeing or disagreeing, there is a better than chance probability ($p < .001$) that the proportion of those who agree with the statement is more than the proportion of those who disagree.

Inspection of the correlation between perceptions shows a significant consistent association between perceptions. Those who agree with one perception are likely to agree with other perceptions; the converse is also true. For example, those who perceive trucks are driving too fast are likely to perceive that trucks represent a safety hazard on the highways. Similarly, those who do not get nervous driving near trucks do not believe that trucks passing each other represent a dangerous condition.

Based on the results of the national sample, we can conclude that the overall perception of truck behavior on the highways is negative. The results show that the majority of respondents agree with the perception that trucks represent a safety hazard on the highway. Additionally, truck drivers are perceived to speed

Table 1. Means and Frequencies for Perceptions Toward Trucks

Perception of Trucks on the Highway	Mean	Percentage of Response		
		Disagree (1-2)	Neutral (3)	Agree (4-5)
Truck drivers often drive in ways that are dangerous to passenger cars (DANGER).	3.10	46.9	5.4	47.8
During a rainstorm, the water from large trucks creates dangerous conditions for other vehicles (WET).	3.93	15.5	4.5	80.0
Drivers of large trucks frequently drive too fast (FAST).	3.33	38.1	5.6	56.2
Large trucks frequently create dangerous conditions by trying to pass each other (PASS).	3.24	41.4	5.3	53.3
Large trucks present a safety hazard on the highways (HAZARD).	3.26	39.2	4.4	56.4
Driving beside or near large trucks makes me nervous (NERVOUS).	3.46	34.7	1.9	63.5

Respondents were asked their level of agreement with each perception on a 5-point scale, with 1= Strongly Disagree, 2 = Disagree, 3 = Neutral/Don't Know, 4 = Agree, 5=Strongly Agree.

Table 2. Correlations Between Perceptions

	HAZARD	NERVOUS	DANGER	WET	FAST	PASS
HAZARD	1					
NERVOUS	0.45	1				
DANGER	0.50	0.39	1			
WET	0.37	0.30	0.35	1		
FAST	0.48	0.41	0.62	0.40	1	
PASS	0.48	0.36	0.54	0.38	0.56	1

All correlations are significant at $p < .01$
All variables assessed on a 5-point scale

and create dangerous conditions for others when passing and during rainstorms. These perceptions perhaps contribute to the overall nervousness of drivers in the presence of trucks. The analysis of correlations supports interrelationships between perceptions. Each perception is significantly associated with all of the other perceptions, suggesting motorists have an embedded overall image of trucks, supported by our single factor solution.

Research Question 2: Is there a relationship between established predictors of highway behavior and perceptions of trucks?

In the results for RQ1, we noted a single factor for the six truck perception variables. We therefore assessed scale reliability for the combined measure and found a resultant Cronbach alpha of 0.82, indicating support for a single, multi-item measure for perceptions of trucks. This variable was coded such that higher values of PERCEPTION indicate stronger agreement that trucks are perceived negatively. This multi-item measure (PERCEPTION) serves as the dependent measure in the analysis for RQ2.

For the independent variables, previous accident analysis research has used demographic, experience, and risky driving related variables to understand accidents. We selected variables that were already contained in the SSRC survey to represent each of these areas. Age and gender, as well as their interaction, were used as independent demographic variables. The SSRC also collected data on driver experience, including the number of miles driven per week, frequency of driving, and general accident history. We included a question that assessed a motorist's accident history with large trucks. For risky driving behavior, we asked respondents whether they have received a moving violation in the past year, if they have been arrested for drunk driving, how often they wear seatbelts, and their level of engagement in other tasks while driving, such as cell phone usage, eating, or smoking. In sum, we used two demographic variables, five variables on driver experience, and seven variables on risky behavior. We also used the interaction between age and miles driven per week for assessing driver experience. Factor analysis of logically grouped variables was conducted with follow-up reliability assessments. This process resulted in the development of the variable CELL, which is a combination of the two questions relating to cell phone usage (LCELL and HCELL; $r = 0.73$).

Regression results are shown in Table 3. Table 3 first provides us the regression results for the multi-item measure of PERCEPTION. First, the model is significant, explaining 6 percent of the variance of the dependent measure, and five of the independent measures exhibit significance. Inspection of the values shows us that males (represented as GENDER, males coded as 1, females as 0), as well as those who drive more miles per week (MILES), those who have had a serious accident in the past (ACC), and those who eat often while driving have an overall less negative perception of trucks. In contrast, those who have had an accident in the past year (YRACC) tend to perceive trucks more negatively. Table 4 provides regression results on the same set of independent variables for each of the six component measures of PERCEPTION. Inspection of Table 4 shows that results across component measures mirror the findings from Table 3. Additionally, we see that seatbelt usage (BELT)

increases as perceptions about trucks becomes more negative and that those who smoke more often while driving view trucks more positively.

Care should be taken in using past accident analysis measures to assess perceptions since none of the models explain more than 10 percent of the variance in the dependent measure. However, we can see that there are significant estimators in each of the regression equations that do contribute to explaining some of the variance and warrant attention (i.e., gender, previous driving experiences, and risky behavior—in particular, distraction behaviors while driving).

Research Question 3: Is there a relationship between perceptions of trucks and motorists' support for stricter regulations concerning trucks?

The multi-item perception measure was entered as the independent variables in a regression model to predict whether or not an individual would support stricter regulations concerning the speed of trucks on the highway. If perceptions were not important in determining support for this form of regulation we would expect that the coefficient would be nonsignificant. Table 5 provides the regression results. Fourteen percent of the variance in support of stricter speed regulation of trucks is explained by the perceptions that motorists have of trucks. Inspection of the coefficients indicates that increased negative perceptions of trucks result in greater agreement that the speed of trucks should be regulated. Overall, this finding does indeed support the belief that motorists' perceptions of truck driving behavior influences support concerning regulations.

Table 3. Regression Results for Research Question 2 - Standardized Coefficients

	PERCEPTION
Demographics	
AGE	−.11
GENDER	−.17**
AGE X GENDER	.01
Driving Experience	
DRIVE	.04
MILES	−.19**
AGE X MILES	.17
ACC	−.08***
TACC	.03
YRACC	.09***
Risky Driving Behavior	
SPEED	−.01
DRINK	−.01
BELT	.03
CELL	.00
EAT	−.09***
SMOKE	−.04
F(15,1372)	7.14***
Adj. R2	0.06

* p≤.10, ** p≤.05, *** p≤.01

Discussion

The purpose of this article was to identify perceptions of trucks on the highway, to explore if existing variables used in transportation accident analysis are efficient predictors of the perceptions, and to determine if motorists' perceptions predict support for tighter regulations of truck speed. Understanding motorists' perceptions, or attitudes, is an important consideration when developing safety programs (Lieb, Wiseman, and Moore 1986). Overwhelmingly, our results show that perceptions of truck driving behavior are predominately negative. Notable was the finding that over 80 percent of respondents felt that trucks create dangerous conditions when driving in the rain. A recent report that evaluated the effectiveness of splash and spray suppression devices (Manser 2003) found that the devices did not significantly reduce spray for newer or older trucks at speeds of 55 mph and 65 mph. The Manser (2003) study does suggest that improvements in aerodynamics can reduce spray; however, this comes as a cost to the trucking firm.

Interestingly, we found that males, those who drive most frequently, and those who drive more miles per week have less negative perceptions toward trucks. This finding suggests that those who drive less frequently are probably less familiar with the behaviors of trucks on the highways and hence less comfortable around them. Specific education or mass media campaigns can be implemented when these individuals are most likely to travel more miles and more often, i.e., before the holiday season, summer vacation travels, and in tourist destination areas. We also found that engagement in risky driving behavior is associated with less negative perceptions of truck drivers. This finding may be useful in the jury selection process

Table 4. Follow-Up Regression Results for Research Question 2 - Standardized Coefficients

	HAZARD	NERVOUS	DANGER	WET	FAST	PASS
Demographics						
AGE	−.09	−.05	−.06	−.07	−.05	−.15*
GENDER	−.10	−.17**	−.06	.00	−.20**	−.20**
AGE X GENDER	.04	−.08	−.05	−.07	.11	.10
Driving Experience						
DRIVE	.02	.03	.02	.04	.05*	.01
MILES	−.15*	−.12	−.10	−.16*	−.16*	−.16*
AGE X MILES	.09	.08	.07	.16	.15	.18
ACC	−.06**	−.04	−.08***	−.03	−.05*	−.06**
TACC	.00	.01	.05*	−.02	.05*	.05*
YRACC	.06**	.04	.09***	.08***	.06**	.07***
Risky Driving Behavior						
SPEED	.03	−.04	−.02	.00	−.04	.00
DRINK	−.03	−.01	−.03	.05	−.02	.00
BELT	.07***	.05*	.00	.06**	.00	−.03
CELL	.00	−.03	.02	.00	.00	.03
EAT	−.06**	−.02	−.08***	−.02	−.11***	−.09***
SMOKE	−.05*	−.06**	.00	.00	−.03	−.03
F(15,1372)	4.37	10.0	3.71	2.16	5.67	3.33
Adj. R2	.04	.09	.03	.01	.05	.03

*p≤.10, ** p≤.05, ***p≤.01

Note: All regression models significant. at p<.01

Table 5. Regression Results for Support of Different Speed Limits for Trucks than Cars - Standardized Coefficient

	LIMIT
PERCEPTION	.38
F(1,1390)	228.7
Adj. R^2	.14

Models and estimate significant. at p<.01

for trucking accident cases. This study suggests that certain drivers may have definite opinions about truck drivers, either predominately negative or positive. In the jury selection process, the possible impact of motorists' perceptions of truckers' driving behavior on the perceived negligence of the truck driver and firm could influence juror selection. The findings show that certain behaviors and experiences affect motorists' perceptions of the relative danger truck drivers present (Robinette and Sherland 2003).

Our results show that while some measures are significant in their respective regressions, the overall explained variance of these variables is markedly low. This in itself is interesting in that we do not really know how perceptions of trucks are formed, even though these perceptions are shown to be significant predictors of support for lower truck speed limits. The trucking industry as a whole should be interested in understanding why the general motorist population supports or doesn't support measures concerning their industry and the elements that contribute to those perceptions.

The overall pattern of significant estimators flows from much of the established accident analysis literature. From this study we see almost a dichotomy in beliefs: Either motorists view trucks negatively and behave accordingly by using safety measures such as increased seatbelt usage and subsequently supporting stricter speed regulation of trucks, or they do not perceive trucks as dangerous and do not support stricter speed limits. Alternatively, our results show that those who engage in distractive behaviors while driving (i.e., eating, smoking) do not perceive trucks negatively.

However, past research has shown that this type of motorist behavior is associated with accidents and noted to be a reason why truck drivers believe accidents occur (Hanowski et al.1999).

We also found that support for stricter regulations was strongly predicted by perceptions. This offers a strong motivation for distribution firms to understand and change perceptions of their industry. Often, in terms of truck regulation, an "us vs. them" attitude emerges with distribution firms blaming motorists and motorists citing truck behavior. For example, after a series of horrific crashes on the Washington D.C. beltway in 1993, Congressional representatives met with the Federal Highway Administration to discuss stricter enforcement of truckers even though these specific accidents were the fault of automobile drivers (Bontz 1993).

Understanding and changing motorists' perceptions of truck driver behavior will not be easy. However, by using mechanisms such as directed mass media communications, firms can build brand trust in the distribution firm's vehicles and personnel's skills (e.g., FedEx, Walmart, USPS, Yellow, Roadway).

Limitations and Future Research

The current study offers opportunities for future research. First, with regard to the antecedents of the perceptions of truck driver behavior, due to the existing surveys length, we used individual items to assess their impact. The collection of the present data, as well as the study's exploratory nature, did not allow for a more expansive list of items that related to the regulatory support measures, socially responsibility actions of firms, and the risk propensity and personality of motorists. Each of these areas offers opportunity for investigation.

Future research may purposively collect personality traits (Garrity and Demick 2001), behavioral predictors such as the Manchester Driving Behavior Questionnaire (Reason et al. 1990), risk-taking behavior (Turner and McClure 2003), and engagement in unsafe driving acts (Stutster 1999) in determining the perceptions that motorists have of truck driver behavior. An additional area of research, which we alluded to in the discussion section, is the role that building brand has on modifying perceptions and subsequent behavior near large trucks. Do motorists perceive the drivers of FedEx trucks differently from those of other lesser-known carriers? If so, do motorists behave differently near these trucks? The answer to this question can then be looked at quantitatively through the comparison of accident data, truck driver perception of motorists' behaviors in their vicinity for trusted brand carriers vs. unknown/not-trusted brand carriers, and changes in attitudes toward large trucks.

Alternatively, a more expansive battery of questions to assess overall perceptions of a firm, including motorists' knowledge of socially responsible actions the firm engages in, such as driver compensation, workload, etc., can be researched to determine if the perception of truck behavior is multi-dimensional in nature. With respect to the impact that these perceptions have, as opposed to our use of a single speed regulation, a broader array of measures that capture support for regulatory issues, such as weight, height, and tandem operation regulations, can be researched.

In conclusion, much of the trucking industry efforts on highway safety are focused on internal changes and policies. Efforts to educate the general driving population concerning the dangers associated with large trucks may be better served if education and industry actions are designed to specifically alter and change perceptions and behaviors.

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Appendix A. Survey Questions, Coding, and Frequencies

Perceptions about Trucks on the Highway	N	Percentage
1. Large trucks present a safety hazard on highways (**HAZARD**).[a]		
1 = Strongly disagree	95	6.8
2 = Disagree	451	32.4
3 = Don't know/neutral	61	4.4
4 = Agree	567	40.7
5 = Strongly agree	218	15.7
2. Driving beside or near large trucks makes me nervous (**NERVOUS**).		
1 = Strongly disagree	84	6.0
2 = Disagree	399	28.7
3 = Don't know/neutral	26	1.9
4 = Agree	555	39.9
5 = Strongly agree	328	23.6
3. Truck drivers often drive in ways that are dangerous to passenger cars (**DANGER**) [a]		
1 = Strongly disagree	87	6.3
2 = Disagree	565	40.6
3 = Don't know/neutral	75	5.4
4 = Agree	451	32.4
5 = Strongly agree	214	15.4
4. During a rainstorm, the water from large trucks creates dangerous conditions for other vehicles (**WET**).[a]		
1 = Strongly disagree	30	2.2
2 = Disagree	185	13.3
3 = Don't know/neutral	63	4.5
4 = Agree	682	49.0
5 = Strongly agree	432	31.0
5. Drivers of large trucks frequently drive too fast (**FAST**).[a]		
1 = Strongly disagree	59	4.2
2 = Disagree	472	33.9
3 = Don't know/neutral	78	5.6
4 = Agree	511	36.7
5 = Strongly agree	272	19.5
6. Large trucks frequently create dangerous conditions by trying to pass each other (**PASS**).[a]		
1 = Strongly disagree	51	3.7
2 = Disagree	525	37.7
3 = Don't know/neutral	74	5.3
4 = Agree	519	37.3
5 = Strongly agree	223	16

Motorists Demographics		N	Percentage
1. Age (**AGE**)[a]	U.S. Population		
18–19 years	4 percent	25	2
20–29	18	202	15
30–39	20	258	19
40–49	20	332	24
50–59	15	272	20
60–69	10	153	11
70–79	7	117	8
80 & up	4	33	2
2. Gender (**GENDER**)[b]			
0 = Female	52 percent	839	60
1 = Male	48	553	40
3. Race			
Caucasian	75 percent	1089	78.2
African-American	12	166	11.9
Other/Refused	13	137	9.8
4. Income			
Under $20,000	22.1 percent	223	16.0
$20,000–$30,000	13	188	13.5
$30,000–$40,000	12.3	194	13.9
$40,000–$50,000	10.7	150	10.8
$50,000–$60,000	9	106	7.6
$60,000–$100,000	20.6	233	13.7
Over $100,000	12.1	111	8.0
Refused		187	13.4

Motorists' Driving Experience	N	Percentage
1. How often do you drive a car or other motor vehicle (**DRIVE**)?		
1= Only certain times a year	15	1.0
2 = Once a week or less	39	3.0
3 = Several days a week	91	7.0
4 = Every day	1247	90.0
2. About how many miles do you drive in an average week (**MILES**)?[a]		
1 = None	7	1.0
2 = Less than 50 miles	292	21.0
3 = 50£–100 miles	471	33.8
4 = 101–200 miles	288	20.7
5 = 201–500 miles	241	17.3
6 = More than 500 miles	93	6.7
3. Have you ever been in a serious motor vehicle accident while you were driving (**ACC**)?[c]		
0 = No	1042	74.9
1 = Yes	350	25.1
4. Have you ever been in an accident involving a large truck (semi, tractor-trailer) (**TACC**)?[c]		
0 = No	1301	93.5
1 = Yes	91	6.5
5. In the past year, have you had an accident while driving (**YRACC**)?		
0 = No	1255	90.2
1 = Yes	137	9.8

Motorists' Risky Driving Behavior	N	Percentage
1. In the past year, have you received a ticket for speeding or some other moving violation? (**SPEED**)?[c]		
0 = No	1239	89.0
1 = Yes	153	11.0
2. Have you ever been arrested for drinking and driving (**DRINK**)?[d]		
0 = No	1300	93.7
1 = Yes	88	6.3
3. How often do you use a seatbelt while driving or riding in a motor vehicle (**BELT**)?		
1 = Never	48	3.4
2 = Rarely	27	1.9
3 = Sometimes	60	4.3
4 = Most of the time	123	8.8
5 = Always	1134	81.5
4. How frequently do you use a cell phone while driving in light traffic (**LCELL**)?		
1= Never	735	52.8
2 = Rarely	305	21.9
3 = Sometimes	222	15.9
4 = Often	130	9.3
5. How frequently do you use a cell phone while driving in heavy traffic (**HCELL**)?		
1 = Never	969	69.6
2 = Rarely	263	18.9
3 = Sometimes	101	7.3
4 = Often	59	4.2
6. How frequently do you eat or drink while driving (**EAT**)?		
1 = Never	402	28.9
2 = Rarely	366	26.3
3 = Sometimes	368	26.4
4 = Often	256	18.4
7. How frequently do you smoke while driving (**SMOKE**)?		
1 = Never	1088	72.1
2 = Rarely	32	2.1
3 = Sometimes	78	5.2
4 = Often	194	12.9
Motorists' Attitude Toward Regulations	**N**	**Percentage**
1. Should the highway speed limit for commercial trucks be lower than it is for automobiles and passenger cars (**LIMIT**)?		
1 = No	656	47.1
2 = Not sure	108	7.8
3 = Yes	628	45.1

[a] For the respondents who refused to answer, response was coded as median value for variable.

[b] 11 subjects that were unclassifiable by voice were coded as male.

[c] For the respondents who refused to answer or weren't sure, response was coded as no.

[d] For the respondents who refused to answer, response was coded as missing.