

Aggressive Driving in Young Motorists

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Abstract—Road rage is an increasingly prevalent expression of aggression in our society. Its dangers are apparent and understanding its causes may shed light on preventative measures. This study involved a fifteen-minute survey administered to 147 undergraduate students at a North Eastern suburban university. The survey consisted of a demographics section, questions regarding financial investment in respondents' vehicles, experience driving, habits of driving, experiences witnessing role models driving, and an evaluation of road rage behavior using the Driving Vengeance Questionnaire. The study found no significant differences in driving aggression between respondents who were financially invested in their vehicle compared to those who were not, or between respondents who drove in heavy traffic hours compared to those who did not, suggesting internal factors correlate with aggressive driving habits. The study also found significant differences in driving aggression between males versus females, those with more points on their license versus fewer points, and those who witnessed parents driving aggressively very often versus rarely or never. Additional studies can investigate how witnessing parents driving aggressively is related to future driving behaviors.

Keywords—Aggression, college, driving, road rage.

I. INTRODUCTION

DISPLACED aggression is a phenomenon wherein a person is provoked in one instance but does not respond. The "displaced" aggression is then directed towards a different person or situation, called trait displaced aggression. This person or situation could have no relationship to the original provoking event, but some trigger will set off the aggressive act [1]. A familiar expression of displaced aggression is road rage, or driving aggression. Road rage, as defined in this study, refers to "a situation where a driver or passenger attempts to kill, injure, or intimidate a pedestrian, or another driver or passenger or to damage another's vehicle in a traffic incident," [2]. It is important to understand the risk factors involved in road rage because of its obvious harmful effect on society. Road rage often leads to injury, death, and psychological distress [2]. Understanding who is prone to

these behaviors may give insight into possible preventive measures [3].

Many studies have sought to find factors correlating with road rage. Studies have found that age and road rage are negatively correlated [3]-[5]. These studies have focused on broad age ranges. This study will attempt to see whether there are differences in road rage tendencies in narrower age ranges by comparing driving aggression between drivers who are teenagers versus drivers who are not teenagers. Because of our sample, our not teenager category is comprised almost completely of 20-22 year olds.

It has been shown [4] that femininity in women is positively correlated with lower driving aggression. Similarly, males scoring high on a Hypermasculinity Inventory (to measure macho personality) showed higher driving aggression [5]. This study will attempt to determine whether gender per se significantly affects aggressive driving.

In the present study, it is hypothesized that people who are more financially invested in their car will exhibit less road rage behavior. First of all, a person who is financially responsible, at least for their car, might be more responsible in general. Also, with a financial obligation to a car one might be wary of engaging in behavior that may damage that car and make one spend more money. In this survey, financial investment in a vehicle was operationally defined as whether respondents paid their own car insurance, bought their own car (if they owned one) and bought their car new or used (if they owned one). These questions would all give insight into how much financial investment each person has to their car and how this correlates to aggressive driving. This study also evaluates how another external factor, driving during heavy traffic hours, correlates with aggressive driving.

Many studies (e.g. [3], [5]) have shown that as you get older, aggressive driving tendencies decrease. It is hypothesized that driver experience will negatively correlate with driver aggression. To this end, this study looked at how long people had their driver's licenses. This would give insight into how experience on the road affects aggressive driving.

This study asked if people had taken a defensive driving course. It is postulated that drivers who have taken a defensive driving course may actually be prone to more aggressive driving. This is because most people who take defensive driving courses do so because it will take points off of their license. This means that they have been in aggressive driving situations already and have received tickets for them. The study also asked people how many points they have on their license to see whether this correlates with more aggressive driving tendencies.

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This study attempts to see whether people who witnessed road rage behavior from parents or guardians as they were growing up showed higher road rage tendencies. This could mean that there is an environmental component or biological component to aggressive driving. Which one would be undeterminable from our survey, but further research could be done on this issue.

II. METHODS

Sample

The sample consisted of a total of 147 respondents. The majority of the sample was female (62%). The age ranged from 18 to 49. The mean age was 20.65 (SD=3.667) and the median age was 20. The sample was predominantly White (72.1%) followed by Hispanic (10.2%), Asian (7.5%), Black (6.1%), other (2.0%), and Native Hawaiian (1.4%). Those who identified themselves as "other" did not specify their ethnic background.

Instruments

Demographics Questionnaire: The first two pages of the survey consisted of demographics questions and also questions regarding experience driving, financial investment in the car respondents operate, motivation for buying the vehicle, and consistency of seeing parents driving aggressively.

Driving Vengeance Questionnaire (DVQ) [6]: The DVQ was used as a scale to measure road rage tendencies. The DVQ consists of fifteen questions. Each question presents respondents with a situation that they may encounter while driving. The respondents are asked to think about how they may react in the given situations. Responses range from doing nothing to bumping the other person with their car.

Scoring of the DVQ consists of assigning a number to the level of severity of response given. The most extreme response is given a number of four. There are two more responses that can be given that are of less severity, assigned a three and two. Finally, a one is assigned for a response of "do nothing." Assigned numbers are added up for all fifteen questions. Higher scores on the DVQ reflect more aggressive driving tendencies, and thus more road rage.

The DVQ authors reported reliability and validity data [6]. A Cronbach alpha reliability coefficient of .83 indicates a high level of internal reliability. Significant correlations between the DVQ score and impulsivity, habitual criminality, and escapism suggest the convergent validity of the DVQ.

Procedure

Respondents were recruited at a North Eastern suburban university and were all undergraduate university students. They were asked to participate in a survey at the end of a lecture class. The survey took about ten to fifteen minutes to complete. The survey was filled out using a pencil or pen. Participation was completely voluntary and no incentive was given.

Analysis

Two-tailed independent samples t-tests were conducted to

compare performance on the DVQ of teenagers versus non-teenagers, males versus females, those who paid their own car insurance versus those who did not, those who bought their own car versus those who did not, those who bought their car new versus used, those who took a defensive driving course versus those who did not, and those who drove in heavy traffic hours versus those who did not. Pearson correlation coefficients were computed to compare DVQ sum with the number of years respondents had their licenses and with the amount of points respondents had on their licenses. A one-way ANOVA was conducted to compare DVQ sum and the frequency with which respondents witnessed parents driving aggressively.

III. RESULTS

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that teenagers would exhibit more road rage than non-teenagers. The test was not significant, $t(133.325)=1.427$, $p=.156$. Respondents who were teenagers ($M=32.19$, $SD=8.209$) showed no significant difference than non-teenagers ($M=30.47$, $SD=5.838$) in their responses on the DVQ.

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that males would have more road rage than females. The test was significant, $t(145)=2.079$, $p=.039$. Respondents who were male ($M=33.00$, $SD=8.137$) showed significantly higher scores in their responses on the DVQ compared to females ($M=30.37$, $SD=6.976$). The effect size was small, $r^2=0.0289$.

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that people who paid their own car insurance would have less road rage than those who did not. The test was not significant, $t(59.323)=-.515$, $p=.608$. Respondents who paid their insurance ($M=31.95$, $SD=8.969$) did not show significantly different scores in their responses on the DVQ compared to those who did not pay their own insurance ($M=31.15$, $SD=6.917$).

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that people who purchased their own car would have less road rage than those who had not. The test was not significant, $t(145)=.239$, $p=.811$. Respondents who bought their own cars ($M=31.19$, $SD=6.724$) did not show significantly different scores in their responses on the DVQ compared to those who did not buy their own cars ($M=31.49$, $SD=8.034$).

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that people who purchased their car new would have different road rage tendencies than those who purchased their car used. The test was not significant, $t(145)=.179$, $p=.858$. Respondents who bought their car new ($M=31.23$, $SD=7.807$) did not show significantly different scores in their responses on the DVQ compared to those who bought their cars used ($M=31.46$, $SD=7.384$).

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that people who drive in heavy traffic hours would have more road rage than those who do not drive at those hours. The test was not significant, $t(145)=-.691$, $p=.491$. Respondents who drove at heavy traffic hours

($M=31.61$, $SD=7.591$) did not show significantly different scores on the DVQ compared to those who did not drive during those hours ($M=30.58$, $SD=7.336$).

A Pearson correlation coefficient was computed between the number of years respondents had been driving and DVQ sum. This correlation was used to evaluate the hypothesis that experience driving will negatively correlate with road rage tendencies. The result of the correlational analysis was not statistically significant, $r=.036$, $p=.665$. The results suggest that there is no correlation between driving experience and road rage tendencies.

A two-tailed independent samples t-test was conducted to evaluate the hypothesis that people who took a defensive driving course would have more road rage than those who had not taken a defensive driving course. The test was not significant, $t(145)=.677$, $p=.499$. Respondents who took defensive driving courses ($M=30.94$, $SD=7.603$) did not show statistically different scores on the DVQ compared to those who had not taken a defensive driving course ($M=31.79$, $SD=7.471$).

A Pearson correlation coefficient was computed between number of points respondents had on their license and DVQ sum. This correlation was used to evaluate the hypothesis that points on one's license will positively correlate with road rage tendencies. The results of the correlational analysis were statistically significant, $r=.182$, $p=.027$. There was a medium effect size, $r^2=0.0915$. The results suggest that there is a positive correlation between points on your license and higher road rage tendencies.

A one-way analysis of variance was conducted to evaluate the relationship between witnessing parents exhibiting road rage tendencies and respondents own road rage tendencies. The independent variable was whether respondents witnessed your parents exhibiting road rage. There were five levels: never, rarely, sometimes, often or very often. The dependent variable was respondent's scores on the DVQ. The ANOVA was significant, $F(4, 142)=3.574$, $p=.008$. Tukey HSD, Scheffe, and Dunnett C post hoc tests were conducted. In the Tukey HSD test there was significant difference between the mean DVQ scores amongst those who witnessed their parents exhibit road rage tendencies very often versus never, $p=.022$, and also those who witnessed their parents exhibit road rage tendencies very often versus rarely, $p=.036$.

IV. DISCUSSION

The data did not support the hypothesis that teenagers would exhibit more road rage than non-teenagers. It is possible that the present findings were due to the restricted age range of the study, where most "non-teenagers" were below the age of 24. This could suggest that previous studies ([3]-[5]) were correct to assume that drivers in the 18-24 age-range exhibit similar driving behaviors regarding aggression.

The data did support the hypothesis that males exhibit higher levels of road rage than females. These results may suggest that females in general exhibit more femininity, males in general exhibit more hypermasculinity, or both. Future studies may want to evaluate femininity and hypermasculinity in both males and females to see how this correlates directly

with aggressive driving.

Financial investment in a car (whether respondents paid their own insurance, bought their own car, bought the car new or used) did not affect how aggressive a driver was. This was contrary to our hypothesis. This suggests that people who drive aggressively are not thinking rationally. If the motivation for driving aggressively is just a general aggressive nature, or displaced aggression, then when acting on those internal feelings, how much people have invested in their car may not be something that is in the forefront of their mind.

Contrary to the hypothesis, respondents who drove in heavy traffic hours were not more aggressive when compared to those who did not drive in heavy traffic hours. This finding suggests driving is affected by internal factors, such as displaced aggression, rather than external factors, such as traffic congestion. If the driver is prone to aggressive driving, then they will do so whether or not they are in heavy traffic.

The number of years a respondent had been driving did not affect aggressive driving. Because the majority of our respondents had less than six years experience driving, our range was restricted. This may suggest that drivers with less than six years of experience have similar driving tendencies related to aggressive driving.

Defensive driving course status did not affect driving aggression. This is possibly due to flaws in the reasoning of the hypothesis. It was assumed that most people that take a defensive driving course are doing so to lower points on their license. What was not taken into account was the fact that many insurance companies offer 10% off of insurance premiums if clients attend defensive driving courses. This can be a benefit for everyone, so there may be an even spread of all drivers taking defensive driving courses, not just aggressive drivers.

Points on a respondent's license significantly and positively correlated with driving aggression. This was consistent with the hypothesis. Although drivers are not stopped by police for all aggressive driving that takes place, habitually aggressive drivers will more likely be pulled over. This will cause them to receive tickets and thus points. So, aggressive driving is correlated with points on your license.

Consistent with the hypothesis, driving aggression was related to frequency of exposure to parental driving aggression. Respondents who witnessed their parents driving aggressively very often drive more aggressively than respondents who never or rarely witnessed their parents driving aggressively. This finding opens up many new questions. Is this finding caused by environment or biology? If the related factor is environment, are drivers influenced more by their father or mother? Or is it the parent that they look up to the most? If the related factor is genetics, which genes cause aggressive driving? Are they the same genes that may cause general aggressiveness? Is biochemistry of the brain a factor? Which hormones and in what levels affect driving aggressiveness? Are neurotransmitters involved? Which ones? Are levels too high or low? Is the problem in the actual neurotransmitters or their receptors? Are the biochemical differences the same ones that cause general aggressiveness? Future studies can shed light on these questions.

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