



Exploring Differences Between Rural & Urban Traffic Safety Culture

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Acknowledgements

HumanFIRST Program, University of Minnesota

Nicholas Ward (*now @ Montana State University*)

Michael Manser

Peter Easterlund

School of Public Health, University of Minnesota

Susan Gerberich

Bruce Alexander

Minnesota Survey Research Center

Pam Jones

Amy Mayer

Rossana Armson

Differences in Crash Risk

Rural Areas Pose A Higher Crash Risk

Higher on-road fatality rate (Brown, Khanna, & Hunt, 2000)

Even accounting for older age of population, road crashes are leading cause of death in rural areas

(Wright, Champagne, Dever, & Clark, 1985)

Crashes tend to be more severe:

- Multiple fatalities
- Dangerous crash type (rollover, head-on)
- Involvement of fatality factors (alcohol, ejected, higher speed)
- Higher percentage of disabled vehicles
- Require hospitalization

(Blatt & Furman, 1998; NHTSA, 1996, 2004)

Potential Explanations for Heightened Rural Crash Risk

More hazardous road environment

- Road type
- Higher speeds
- Curves

Emergency response

- Lower population density = less hospitals
- Longer response times

Safety culture

- May foster high-risk driving behavior



The treatment of this public health issue must focus on the driver, given that most crashes are the result of driver impairment or high-risk driving behavior.

(Evans, 1991) 5

There is Not Just One “Rural Culture”

However, identifying even broad characteristics of a population with higher crash risk will assist in accurately predicting which interventions will be effective & accepted by that population at large.

Typically people from “rural areas” exhibit *some* of these characteristics:

- Conservative
- Deterministic
- Informal social control
- High density acquaintanceship
- Mistrust of government
- Reluctance to share internal problems

(Roth, Roth, & Elgert, 2003; Weisheit, Falcone, & Wells, 2006)

Methodology to Examine Safety Cultures

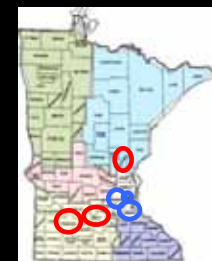
Safety Culture Framework

By examining rural crash risk factors may it then be possible to develop human-centered & culturally sensitive programs to improve traffic safety in both urban & rural America.

Our first step in the process was to understand the attitudes & behaviors that differentiate urban & rural crash risk.

This includes investigating human-centered & culturally sensitive intervention strategies to improve traffic safety.

Participant Counties Sampled



3 Rural Counties

No city population > 5,000

No speed limit > 60 mph

Entire county sampled

Each county represents a different level of fatality risk per 100M VMT

High: 2.62

Med: 1.94

Low: 0.85

3 Urban Counties

Most densely populated areas of Minnesota

Sampled from top 10 populated cities

Highest total vehicle miles traveled (VMT)

Lowest fatality rates per 100M VMT for 2000-2005
Mean: 0.64

Paper Survey

Identify Attitudes

- Behavioral fatality factors
DUI, seatbelt usage, speeding
- Safety interventions
Enforcement, education, smart technologies & engineering
- Standardized measures
DBQ, SSS-V, SMQ

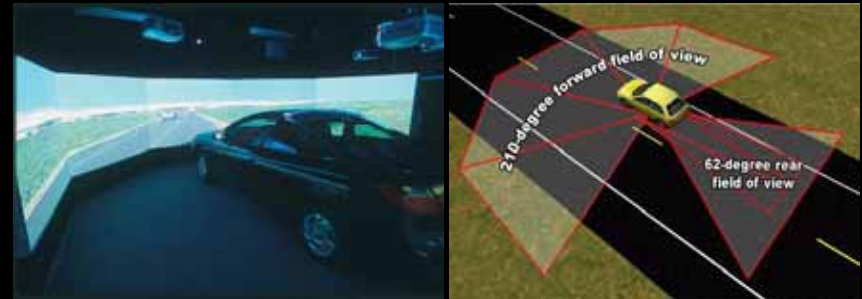
The image shows a survey form titled "UNIVERSITY OF MINNESOTA DRIVING SURVEY". It includes a section for "MINNESOTA DRIVING SURVEY - 8th Year Roadside Report" and a "DRIVING BEHAVIOR" section with a table for recording responses. The table has columns for "Frequency of Behavior" and "Severity of Behavior". The survey includes questions about driving habits, such as "How often do you drink and drive?" and "How often do you use your seat belt?".

Analysis focused on 1300 valid responses from 5000 surveys distributed. Gender & age were controlled for in our analyses.

Driving Simulation

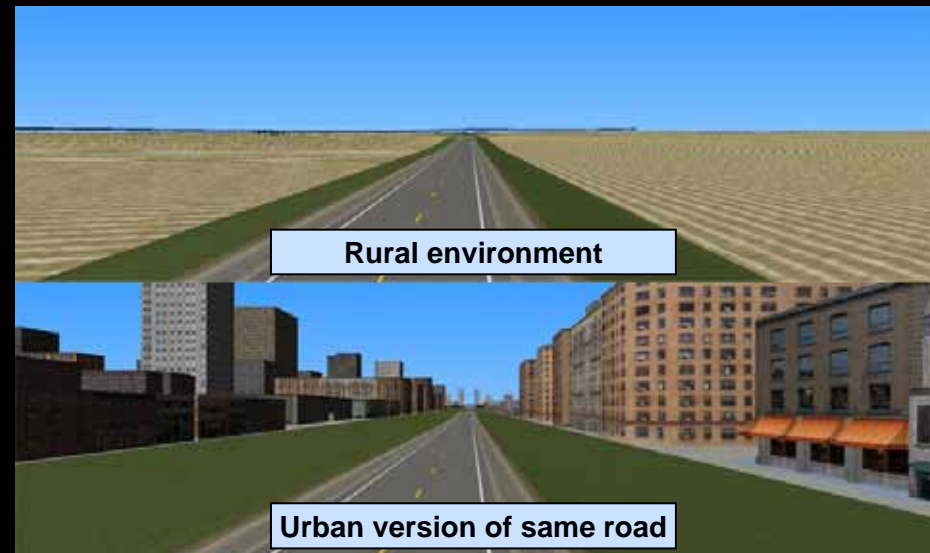
Evaluate Behaviors

- HumanFIRST Program High-Fidelity Driving Simulator



Identical scenarios in rural & urban environments were used to compare driving performance during situations that involve common crash factors:

- Lane position maintenance
- Speed maintenance
- Visual/manual distraction



Focus Group

Qualitatively explore how teens, parents, & seniors defined issues of importance relating to driving safety, including the suitability & effectiveness of proposed driving safety interventions.

Questions related to:

- Perception of crash risk & risk factors that predominate for themselves & their cohort
- Types of interventions that may be applied to reduce traffic crashes
 - Teens were asked about GDL & smart technology
 - Mature drivers were asked about license re-testing & mobility options

Focus Areas:

Interaction of culture with environment

Common risk factors

Traffic safety interventions

Interaction of Culture with Environment

Lack of Mobility Options May Lead to Increased Risk

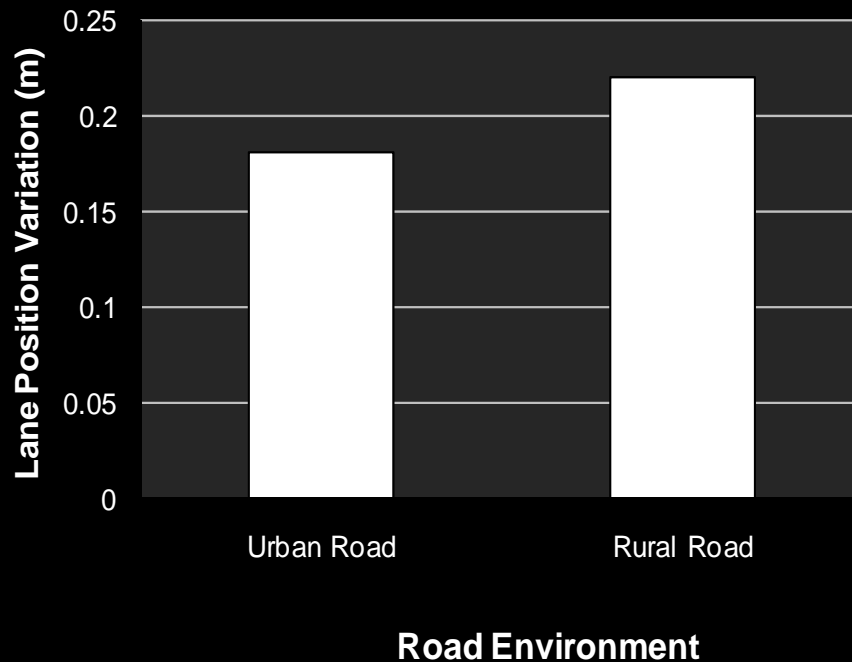
Drivers in our focus group reported it difficult to get essential tasks done without driving themselves.

- Rural respondents only alternative would be to “feel like a pest” & ask friends & relatives for a ride.
- Urban respondents also felt that current options (bus, rail) were often inadequate or difficult to use.

Seniors had strongest desire for this, especially if a mobility service could also assist in other ways.

- It would encourage them to give up their license (& associated automotive fees) sooner
- Provide assistance with carrying packages
- Help keep them from getting lost
- Provide social contact (driver or other passengers)

Driving Environment May Affect Perception of Risk



$$F(1,14) = 9.54, p = 0.013$$

The presence of buildings in the Urban environment resulted in less lane position variation than while driving the simulator in the Rural environment.

This may suggest that more effort was focused on maintaining lane position in the Urban environment due to a higher perceived risk.

Interaction of Culture with Environment

Increasing the number of mobility options might help keep at-risk populations from driving, especially in rural areas when few or no options currently exist.

Because Rural environment may not be perceived as risky, less effort & attention towards driving in Rural areas may lead to increased crash risk.

Common Risk Factors

Speeding Above the Limit

Survey respondents from both Rural & Urban counties weakly agreed that speeding 10 MPH above the limit was dangerous.

Rural residents reported speeding above the limit less frequently than did Urban residents.

Because fatal crashes are more common in Rural areas, this may suggest that a few things:

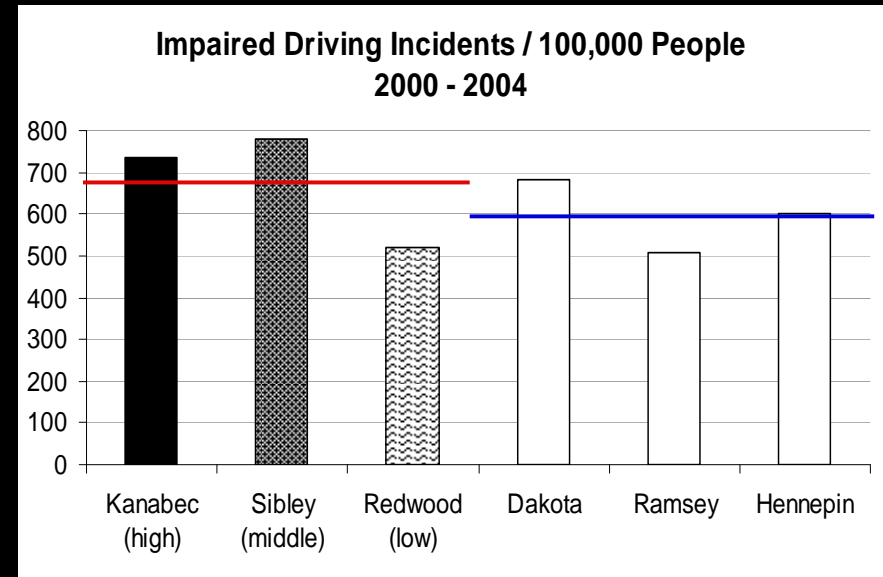
- All drivers underestimate the effects of speeding on safety
- Urban drivers may be more conscious they are speeding over the limit, or just more conscious of the limit itself.
- Fatal single-vehicle run-off road incidents predominate in Rural areas where speed may go unchecked: “Dead men tell no tales”

Driving Under the Influence of Alcohol

Survey respondents from Rural counties reported that driving while intoxicated was less dangerous than did Urban residents.

Both Rural & Urban residents reported almost never driving under the influence.

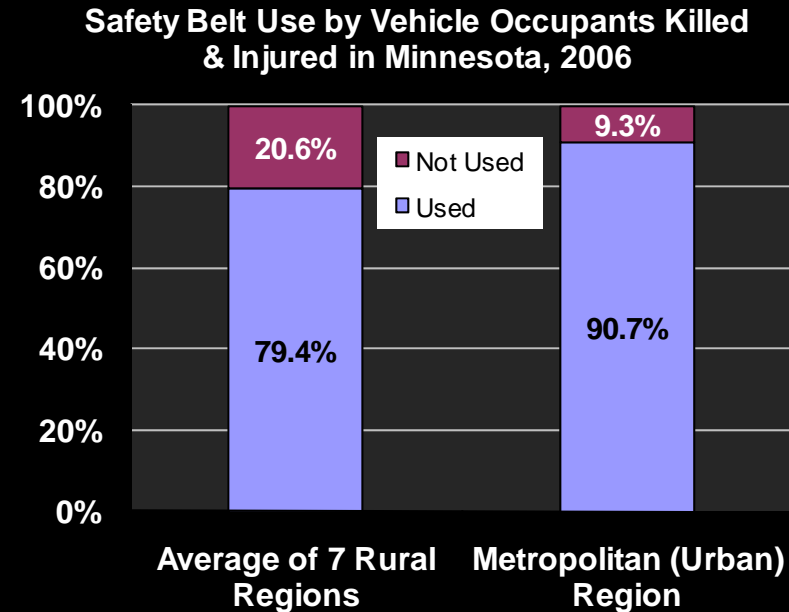
Per capita, there were more impaired driving incidents in our Rural counties than in Urban counties.



Safety Belt Usage

Survey & focus group respondents from Rural counties reported that not wearing a seatbelt was less dangerous, & reported doing so more often than Urban residents.

These trends are confirmed by Minnesota fatal crash data by county.



Safety Belt Usage

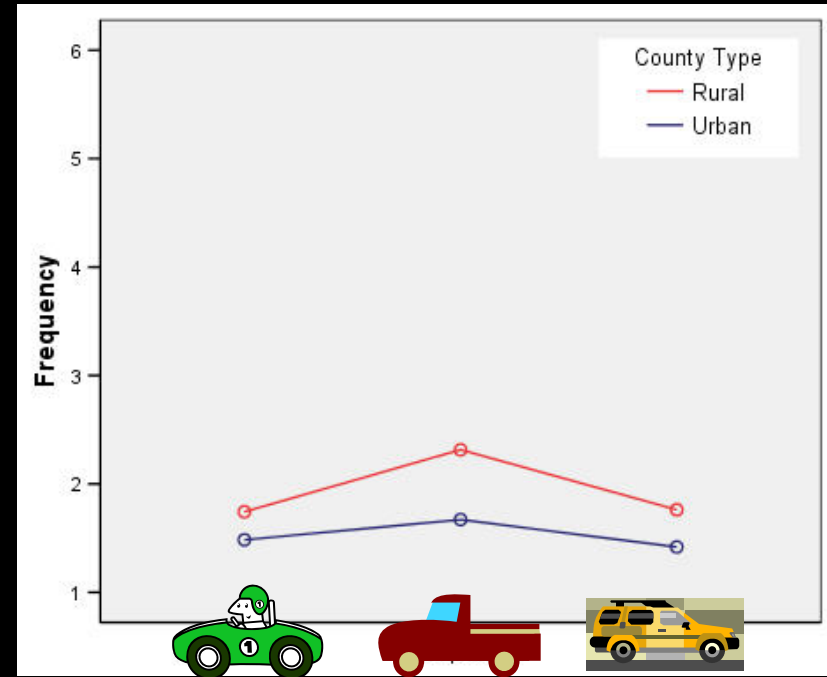
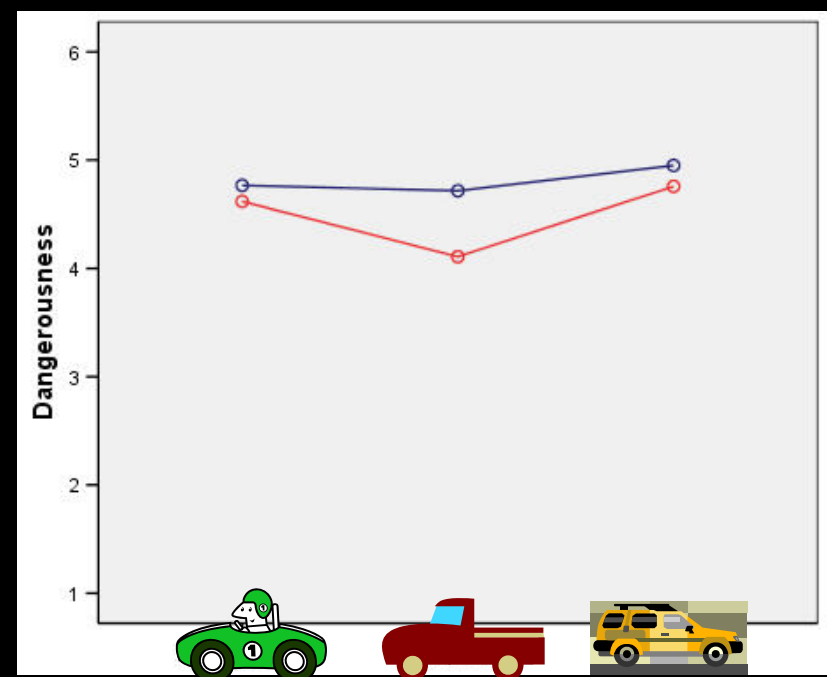
NHTSA reported (2006) that restraint use among fatally injured occupants of SUVs & pickup trucks is much lower compared to passenger cars & vans.

Examined survey data by reported primary vehicle type (car, truck, SUV).

Safety Belt Usage

Survey respondents who drive pickup trucks wore safety belts less frequently than drivers of all other vehicle types; Rural pickup truck drivers wore safety belts less frequently than urban pickup truck drivers.

Pickup truck drivers felt it was less dangerous than passenger car or SUV drivers. Rural pickup truck drivers felt it was less dangerous than urban pickup truck drivers.



Common Risk Factors

Higher fatal crash risk in Rural counties appears to be due to a combination of a higher acceptance of crash precipitation factors (e.g., DUI) & a lower frequency of injury prevention factors (e.g., seat belt usage).

Rural pickup truck drivers have different perceptions on the value of seatbelt useage than drivers of other vehicle types.

- Pickups account for over 20% of all vehicles currently in operation in the US (27% in TX; Experian Automotive, 2008), making this a relevant distinction & potential focus for interventions.

Although Urban drivers report speeding more frequently, other factors must mitigate some of this effect on fatal crash risk.

Traffic Safety Interventions

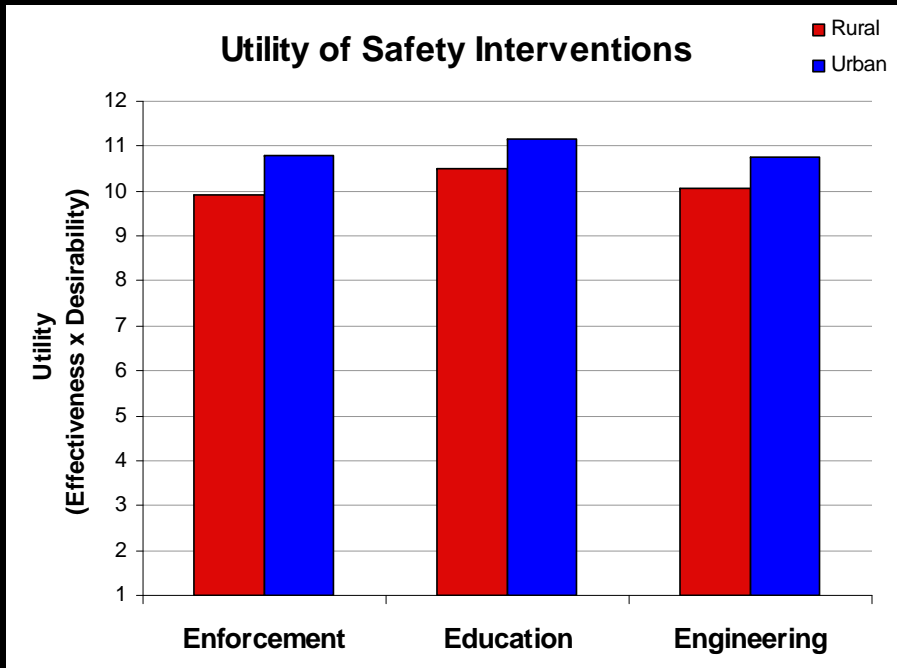
Themes That Emerged from Focus Group Sessions

Strict penalties

- “Hit them in the billfold” or take away cell phones or distractions
- Serious offenses such as DUI or speeding may deter drivers

Increasing mobility options may be a desirable way to reduce the number of drivers who are in at-risk populations.

Perceived Utility of Interventions



Survey respondents were asked how effective & desirable 20 potential interventions would be. These scores were combined into a utility score for each individual intervention. Related interventions were grouped into three categories.

Rural residents reported all intervention categories to have less utility than Urban residents.

In Summary

Effective policy can be tied to specific risk markers (e.g., DUI, seatbelt compliance) & targeted safety interventions (e.g., enforcement focusing on pickup truck drivers in Rural areas)

Drivers in Rural areas may benefit more from education on the risks of DUI, driving without a seatbelt, & speeding.

- Seatbelt education & enforcement efforts focused on rural pickup truck drivers may have large payoff.

There seems to be a lowered perception of risk in Rural driving areas. Increasing the awareness or perception of crash risk in Rural areas may improve safety overall.

Driver Education

Education programs can have a positive impact by raising awareness, focusing preparation, & increasing prevention of crash risks.

Programs that get people talking about driving experiences help to spread the word about those dangerous situations.



Increasing Perception of Crash Risk in Rural Areas

Increase the number & type of environmental cues to raise awareness of road & environment hazards.

Drivers typically adjust behavior to the perceived risk level.

e.g., Shared Space, narrow lanes



Enforcement & Technology

Alcohol & seatbelt enforcement targeting Rural areas should introduce salient costs to these activities, especially if they are coupled with saturated advertisements.

Use of Intelligent Transportation Systems may benefit remote areas that:

- Support the choice & compliance of safe speeds
- Affect seat belt compliance (esp. rural, truck)
- Support safe decisions at intersections & for teens

Thank You

Survey results will soon be available in AAP or by request:

Rakauskas, Ward, Gerberich (*in press*) Identification of differences between rural and urban safety cultures. *Accident Analysis & Prevention*. doi:10.1016/j.aap.2009.05.008

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