

Distracted Driving:
How can we know that
it's a problem?

Herb M. Simpson, Ph.D.,
International Conference on Distracted Driving
October 2-5, 2005

A DRIVING FORCE FOR SAFETY



TRAFFIC INJURY
RESEARCH FOUNDATION

Objectives

- An overview of the strengths and limitations of the various research approaches used to study distracted driving.
- Provide a context for understanding why it is so difficult to answer such fundamental questions as:
 - How risky is distracted driving?
 - How many crashes result from distracted driving?



A matrix of methods

- Surveys
- Observational studies
- Crash-based studies
- Laboratory/experimental studies



A matrix of methods

- Surveys – have people tell you what they see and do.
- Observational studies – watch what they do.
- Crash-based studies – reconstruct what they did.
- Laboratory/experimental studies – monitor what they do under controlled conditions and circumstances.



Surveys

- **Approach**
 - Questionnaire-based
- **Rationale**
 - Obtain estimates of:
 - the prevalence of the problem,
 - how concerned the public is about it,
 - and what they think should be done to fix it.



Surveys

- **Limitations/issues**
 - Honesty and social desirability.
 - Problems of recall.
 - What you ask determines what you get – the problem of phraseology
 - Sample characteristics and non-respondent bias.



Observational studies

- **Approach**

- Direct observation of driving performance in real-world settings (e.g., trained observers at roadside; in-car video recording)
- Researchers judge the frequency of distractions and its impact on performance.

- **Rationale**

- Direct observation overcomes the problems associated with surveys.
- Can provide a rich pool of data in a dynamic real-world environment.



Observational studies

- Limitations/issues
 - Must be unobtrusive – experimenter effect where the observation itself becomes a distraction.
 - Measurement issues – what is a distraction and what impact did it have (overcoming interpretation bias and expectation).



Crash-based studies

- **Approach**
 - Obtain and analyze data generated by others to measure the extent of the problem – police reports, medical, driving, insurance records.
 - Create detailed data using special teams of experts.
- **Rationale**
 - Fundamental purpose is to reconstruct why the crash occurred – i.e., to isolate the human, vehicular and environmental factors that contributed to the crash
 - Fundamental assumption is that evidence gathered at the scene or available from other sources can reveal what the contributory factors were.



Crash-based studies

- **Limitations/issues**
 - **Data availability**
 - Police accident investigations actually represent only a subset of all collisions
 - Distraction as a possible contributory factor is not even present on some police report forms as something to check.
 - **Data quality: reliability/validity**
 - Subjectivity and inferential weaknesses
 - Reports from crash-involved persons are of questionable reliability/validity



Laboratory/experimental studies

- Approach

- In controlled environments, various tasks and conditions are presented to drivers and their performance monitored continuously.

- Rationale

- Control over extraneous variables through various means minimizes alternative explanations for changes in performance.
- Results provide causal, functional relationships (not simply co relational or associational).
- Systematic application of several variables provides insights into interactions.



Laboratory/experimental studies

- Limitations/issues
 - Validation: to what extent are the observed/measured behaviours relevant to actual on-road driving.
 - Relevance: to what extent do the observed behavioural changes translate into an increased risk of collision.



Summary

- There is no such thing as the definitive study – all have methodological and design limitations – some acknowledged; others not.
- No single research approach or design will answer all the questions.
- The weight of converging evidence is the determining factor.



