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TITLE: Reintegrating Troops with Mild Traumatic Brain Injury (mTBI) into their Communities: Understanding the Scope and Timeline of Post-Deployment Driving Problems

PRINCIPAL INVESTIGATOR: Erica Stern Todd Rockwood

CONTRACTING ORGANIZATION: University of Minnesota Minneapolis, MN 55455

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Reintegrating Troops with Mild Traumatic Brain Injury (mTBI) into their Communities: Understanding the Scope and Timeline of Post-Deployment Driving Problems

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Erica Stern, Rodd Rockwood

E-Mail: Stern001@umn.edu

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**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT**
This study is designed to examine the extent to which combat driving behaviors and anxieties are carried-over into driving on American roads post-deployment from service in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) and to compare such behaviors in Service Members (SMs) who have not served in OEF/OIF and do and do not have mild traumatic brain injury (mTBI). The study has struggled to gain access to subjects. PI's ORISE Faculty Fellowship US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has offered slow progress. An initial plan to collaborate with BAMC was terminated with that institution citing excess research demands. Project is in process with command and OICs of Research at Ft. Riley and Ft. Hood and with command of CBWTUs (COL Mozden) to gain access to SMs with mTBI. No progress in accessing uninjured Soldiers (with and without OEF/OIF service). Presentation of original pilot data a Military Health Research Forum was reported on front page of US Today (Sept 1, 2009) and St. Paul Pioneer Press (Sep 1, 2009), as well as many military and civilian websites Marines and National PTSD center have expressed interest in collaboration on project. No data gathered; no findings to report.

**15. SUBJECT TERMS**
Driving, reintegration, safety

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**Standard Form 298 (Rev. 8-98)**
**Prescribed by ANSI Std. Z39.18**

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**INTRODUCTION**: Service Members (SMs), especially Soldiers, serving in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) use combat driving maneuvers to avoid roadway threats. These become automatic as they are performed repeatedly and strongly linked to safety. A regional pilot study by the PI and graduate students (Riley-Chiabotti , Hieb, Welle, **Stern**, 2008; **Stern,** 2009; Christensen, Escobar, Riess, **Stern,** 2009) indicated that post-deployed Soldiers may have high levels of carryover behaviors and anxieties and that these behaviors are long lived issues – lasting for several months post-deployment. Reflecting Killgore, Cotting, Thomas, et al's. (2008) finding that general combat trauma influences risky behaviors post-deployment (including risky driving), driving carryover behaviors and anxieties regressed significantly on the level of Soldiers' OIF/OEF driving-related trauma (Polzin, Wenker, **Stern EB**, 2009). The current CDMRP study builds upon these findings, using a drop-off-mail-back survey to provide firm national data on the scale, incidence, and timeline of combat-driving behaviors among post-deployed Soldiers with and without mild traumatic brain injury (mTBI) or mTBI with post-traumatic stress syndrome (mTBI/PTSD), and compares Post-deployment Soldiers to Soldiers who have not served in OEF/OIF. The study's goals are to determine the extent to which combat driving tendencies are carried over into post-deployment driving on American roads by Soldiers with mTBI and those without mTBI, to separate driving behaviors associated with military service from those associated with brain injury or deployment, to examine the impact of dual diagnosis of mTBI/PTSD on driving carryover, and to establish military respondents' self-recognition of driving behaviors relative to an informed third party report as a measure of self-awareness. Further, the study compares the responses of survey participants in the three strata mentioned above with a *Knowledgeable Other*, a person identified by the military respondent as someone who has been a passenger with the service member. The ultimate purpose of the study is to describe behaviors and needs to allow appropriate post-deployment program development for Soldiers, families, and communities.

**BODY**:

Project work is at Task 1 'Obtain IRB approval", although the effort is not so much centered on IRB applications, as it is on recruiting collaborating commanders and sites that will allow access to invite participation of Service Members (SMs). The original project methodology proposed a database derived mailed survey. When funded, CDMRP staff informed us that such a database was not available for our use, and that an alternative method was needed. Thus the project was altered to be one of a drop off-mail/phone return. As such, the study relies on access to sites with SMs who have and have not served in OIF/OEF, and who do and do not have mTBI. Gaining this access has been more problematic than anticipated. In furtherance of the goal, over the past year we have:

- Gained approval for the project from University of Minnesota's IRB and HRPO (with understanding that individual site approvals are needed before work can commence).
- Had multiple contacts (email/telephone/in person) and ongoing discussion with 20 Army National Guard Chief and Deputy State Surgeons. In spite of these, the project has not gained access to SMs. In one state's case ( NY), the State Surgeons supported our request for access, but this request was ultimately declined by the ANG Chief of Staff. In all other cases, contact persons ceased responding to telephone and email efforts – sometimes after months of communications.
- Prepared study summaries for LTC Woollen's two FORSCOM briefings on research access needs.
- Sought additional access opportunities through networking:
    - Participated in the Army Educators Tour, during which time a personal visit to BAMC TBI clinic, gained a willing local PI and A-PI for the study. An IRB application was developed with consultation from BAMC IRB, but was not submitted. The TBI Clinic Chief indicated that the application was not put forward because of competing research demands on personnel and patients. OIC for Research at other military facilities have since informed this PI that collaborative assistance must be provided by military, not civilian, personnel, and that may have been an issue at BAMC where both PI and A-PI were civilian.
    - Erica Stern (PI) sought and received US Army Center for Health Promotion and Preventive Medicine (USACHPPM) ORISE Faculty Fellow with focus on driving issues. This Fellowship has shown promise in gaining access to SMs with mTBI. It allowed contact with Army medical leadership and led to progress in efforts to survey SMs at Ft. Hood, Ft. Riley, and the CBWTUs nationwide. Permissions to move on these sites are in

process with designated local PI and contacts made to OIC of Research at each fort, and endorsement of both COL Mozden (CBWTU) and BG Cheek (WTU).
- Presented pilot study results to military audiences in an effort to increase likelihood of collaboration with command:
  - Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury's Driving Evaluations after Traumatic Brain Injury Conference (July 2009
  - Military Health Research Forum (September 2009)
- Served on military panels:
  - Telemedicine and Advanced Technology Research Center (TATRC) Product Line Review (PLR) (Scheduled for October 2009)

- In addition, recognizing that the limited time remaining for the study makes survey return rate a key issue, we have reduced the survey length. Questions removed do not relate to the key questions of the study (i.e., carryover behaviors and anxieties). New surveys to be filed with CDMRP and HRPO before use.

**KEY RESEARCH ACCOMPLISHMENTS:**
The project has been unable to gain access to SMs for the national survey, although it appears likely that current efforts will produce access to SMs with mTBI. Ongoing efforts to recruit collaborators and gain access have had collateral benefits of broadening understanding of post-deployment issues and knowledge of CDMRP's funding of the national project though presentation of the PI's pilot data on the topic and alliance with US Army Center for Health Promotion and Preventive Medicine (USACHPPM) and Proponency Office for Rehabilitation and Reintegration.

- **Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury's *Driving Evaluations after Traumatic Brain Injury Conference*** (July 2009, Washington, DC) Presentation of related pilot data; generated connection with Ft. Hood as possible site for mTBI survey.

- **Military Health Research Forum poster and briefing** (September 2009, Kansas City MO)
  - Generated strong public interest in the topic, including front page coverage in popular press (USAToday http://www.usatoday.com/news/military/2009-08-31-troops-risky-driving_N.htm, Pioneer Press – Sept 1, 2009, no longer available without cost online), radio (WCCO picked up by United Press International http://www.upi.com/Top_News/2009/09/01/Study-Some-Iraq-vets-drive-aggressively/UPI-12461251809027), and internet websites such as Science Blog http://www.scienceblog.com/cms/progress-made-traumatic-brain-injury-treatment-and-diagnosis-24716.html

  - Connected to other researchers on driving and PTSD ( Eric Kuhn, Co-Director for Education, National Center for PTSD, VA Palo Alto Health Care System
  - Connected to Marine command interested in participating in study or developing parallel work for that branch (Cmdr Jack Tsao, CAPT Thomas Johnson, LCDR Julio Rentas, and J Greenberg)
- **ORISE Faculty Fellowship USACHPPM for Erica Stern (PI)** Has led to support for access to CBWTU and Ft. Riley contact that is progressing toward access.

**REPORTABLE OUTCOMES:** In our ongoing efforts to gain access to subjects, we have capitalized on every opportunity, including those primarily involved with other military research or program development mentioned above:

- Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury's Driving Evaluations after Traumatic Brain Injury Conference (July 2009, Washington, DC)
- Poster and briefing presentation at Military Health Research Forum (2009) which included more extensive analysis of our pilot data collected prior to the current grant, including that of regression analyses on research poster in appendix B.
- ORISE Faculty Fellowship for Erica Stern (PI)

**CONCLUSION: We continue to work to access subjects for the current CDMRP study, and would deeply appreciate assistance toward that goal.** It is a critical issue. We have made more detailed analysis of our pilot data (collected prior to the current grant) and used these data in presentations to increase public and military awareness of post-deployment driving issues and hopefully spur greater willingness to collaborate among military and military health care command. People express interest in getting our results, but in general seem hesitant to allow access to 'their' Soldiers. As we present the pilot data no one has yet indicated that their region's personnel dramatically differ in behaviors from the pilot findings, although some question the incidence and levels of driving related anxieties that we found. This alone emphasizes the need for national data to allow reasonable program planning. As we pursue access to SMs, my graduate student groups and I are developing and focus group testing informational materials for Soldiers and Family/friends on post-deployment driving with simple suggestions that were endorsed as helpful in an earlier pilot study.

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Riley-Chiabotti L, Hieb A, Welle L, **Stern EB** (2008) From Willmar/St Paul To Iraq/Afghanistan: Report of two current studies of Minnesota drivers. Minnesota Occupational Therapy Association, St Cloud, MN.

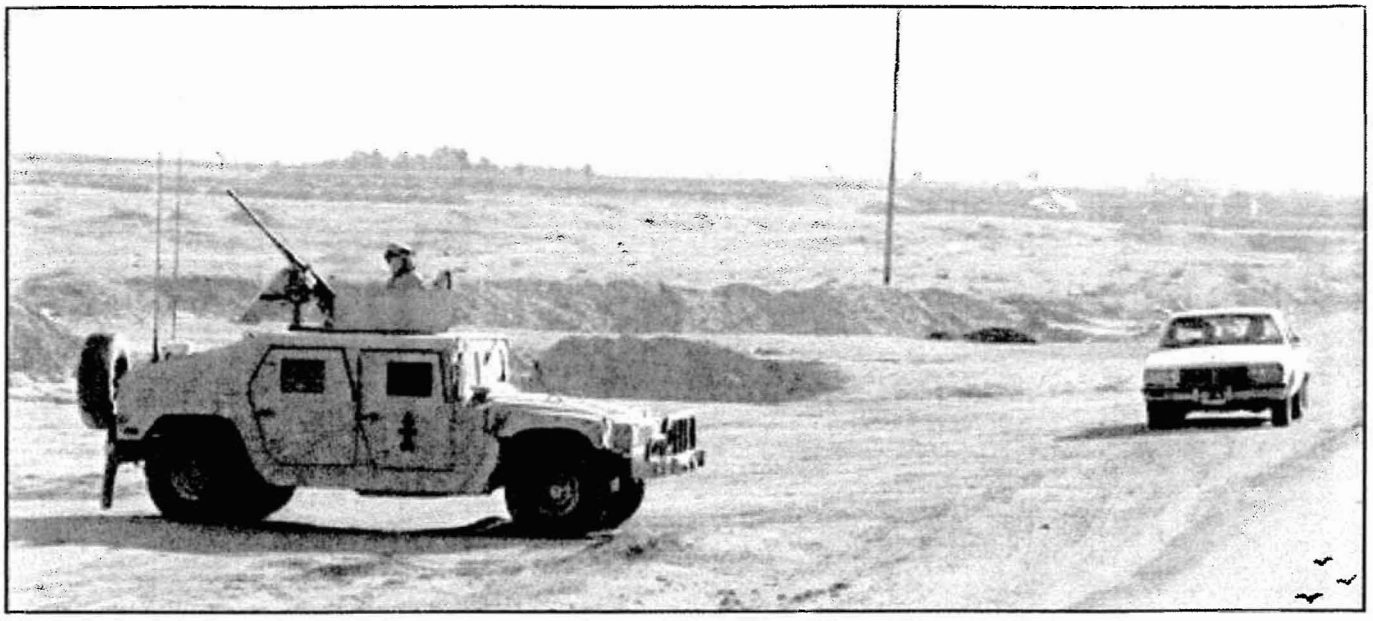
**Stern, E** (2009) Post-deployment Driving Behaviors and Driving-related Anxieties". Driving Assessment Conference, Defense Centers of Excellence (DCoE) for Psychological Health and Traumatic Brain Injury. Washington, DC.

Polzin J, Wenker K, **Stern EB** (2009) Personal and Experiential Factors Associated with Driving Reintegration of Soldiers Post-deployment from OIF/OEF. MOT Defense, University of Minnesota, Minneapolis, MN.

Christensen E, Escobar O, Riess J, **Stern EB** (2009). Comparison of Self-Reported Driving Behaviors and Anxieties of OIF/OEF Soldiers at 30, 60, and 90 days Post-Deployment. MOT Defense, University of Minnesota, Minneapolis, MN.

Killgore, W. D. S., Cotting, D. I., Thomas, J. L., Cox, A. L., McGurk, D., Vo, A. H., et al. (2008). Post-combat invincibility: Violent combat experiences are associated with increased risk-taking propensity following deployment. *Journal of Psychiatric Research, 42,* 1112-1121

**APPENDICES:** Attached as appendices are copies of the new shorter Service Member's survey, the Military Health Research Forum poster and pilot study posters cited in the References.



# Driving Post-Deployment: A Survey of Military Personnel

Study Conducted By:
Program in Occupational Therapy
University of Minnesota

Sponsored By:
Department of Defense's
Congressionally Directed Medical Research Program

Your participation in this survey is voluntary and
you may choose to skip any item you do not wish to answer.

## Part 1: Your Service History

Q1 What is your branch of military service?

1 □ Air Force
2 □ Army
3 □ Marines
4 □ Navy
5 □ Coast Guard

Q2 Are you Active Service?

1 □ No. → If No, Are you:
- 1 □ Reserve
- 2 □ National Guard
- 3 □ No longer in service

2 □ Yes

Q3 What is your current military pay grade?

1 □ E-1 to E-6
2 □ E-7 to E-9
3 □ WO-1 to WO-5
4 □ O-1 to O-3
5 □ O-4 to O-10

Q4 How many years have you been in military service?

|__|__| Years service

Q5 Have you ever been deployed to Iraq or Afghanistan?

1 □ No → Skip to Part 3 on Page 3
2 □ Yes

Q6 Where was your most recent deployment?

1 □ Iraq (OIF)
2 □ Afghanistan (OEF)
3 □ Someplace else, Describe: _____

Q7 Please provide the information regarding all your deployment(s) to either Iraq and Afghanistan.

| | Iraq (OIF) | Afghanistan (OEF) |
|---|---|---|
| a. Total number of deployments to | ___ | ___ |
| b. Total months deployed | ____ | ____ |
| c. How long since your last deployment ended | ____ | ____ |

Q8 Thinking specifically about your most recent deployment to either Iraq or Afghanistan, how long was your last deployment?

___ Months

## Part 2: Driving During Your Last Deployment to Iraq of Afghanistan

**Please answer the following about your experiences in Land Vehicles during your most recent deployment to Iraq or Afghanistan.**

Q9 During your most recent deployment in OIF or OEF were you ever involved in convoy duty associated with the transportation of materials, supplies or troops?

1 □ Yes ➔ If Yes, How often? 1 □ Weekly
2 □ No 2 □ Monthly
3 □ Less often than that

Q10 The following items are about your driving experiences during an average or typical week during your most recent deployment to OIF/OEF

| | Never | 1-2 Times A Week | 3-4 Times A Week | 5+ Times A Week |
|---|---|---|---|---|
| a. How often were you a passenger in a land vehicle off-base or outside the wire? (If most of this was in a tank please check this box □) | □0 | □1 | □2 | □3 |
| b. How often did you drive a land vehicle off-base or outside the wire? (If most of this was in a tank please check this box □) | □0 | □1 | □2 | □3 |

Q11 Combining your travel as either a passenger or a driver, how many miles of ground travel did you have off-base or outside the wire, during an average week?

1 □ 1-25 Miles a week
2 □ 25-50 Miles a week
3 □ 50-75 Miles a week
4 □ 75-100 Miles a week
5 □ 100 or more Miles a week

Q12 The next items are about enemy action. Please indicate how many times each of them occurred during the entire time of your most recent deployment to OIF or OEF:

| How many times: | 0 NEVER | 1-2 TIMES | 3-4 TIMES | 5-6 TIMES | 7+ TIMES |
|---|---|---|---|---|---|
| a Did your vehicle drive through small arms fire | □0 | □1 | □2 | □3 | □4 |
| b Were you in a vehicle that was near but not caught in an IED explosion? | □0 | □1 | □2 | □3 | □4 |
| c Were you in a vehicle when it was caught in an IED explosion? | □0 | □1 | □2 | □3 | □4 |
| d Were you in a vehicle that was exposed to artillery, RPG, mortar, or similar fire? | □0 | □1 | □2 | □3 | □4 |

Q13 In total during your last deployment how many times did a vehicle you were in crash or overturn for any reason?

|_|_|_| Number ➔ How many of these were related to enemy action?

1 □ None
2 □ A Few
3 □ Some
4 □ Most

Q14 How soon did you start driving in America, after your most recent Iraq or Afghanistan deployment ended?

1 □ Immediately on return to America
2 □ Within a week of return to America
3 □ Within a month of return to America
4 □ Within 1 to 2 months of return to America
5 □ After 3 months or more

## Part 3: Driving During the Past 30 Days in America

Q15 In the past 30 days, how often have you driven a privately owned vehicle?

0 □ Have not driven ➔ Skip to Part 4 on Page 7
1 □ Daily
2 □ 4-6 days a week
3 □ 1-3 days a week
4 □ Less frequently than that

Q16 In the past 30 days, how many miles have you driven?

|_|_|_|_|_| Miles Past Month

Q17 Which of the following do you usually drive?

1 □ Motorcycle
2 □ Car
3 □ Mini-Van
4 □ SUV or Pick-Up Truck
5 □ Other - Describe: _____

Q18 Not including commuting to and from work, do you have to drive as part of your job (e.g. truck driver, delivery service, etc)?

1 □ No

2 □ Yes → If Yes, how many miles have your driven as part of your job in the past 30 days? |__|__|__|__| (Miles)

Q19 In the past 30 days, how often did you:

| | 0 NEVER | 1 ONCE | 2 TWICE | 3+ TIMES |
|---|---|---|---|---|
| a. Receive a warning from police/trooper for a moving violation | □0 | □1 | □2 | □3 |
| b. Receive a ticket for a moving violation | □0 | □1 | □2 | □3 |
| c. Hit another car or person while driving | □0 | □1 | □2 | □3 |
| d. Get hit by another vehicle while driving | □0 | □1 | □2 | □3 |

Q20 Thinking about the past 30 days, how often have you done each of the following. If you work in emergency services, police, fire, ambulance, etc., please respond based on your personal driving, not on work related driving.

| | ALMOST NEVER | RARELY | SOMETIMES | USUALLY | ALMOST ALWAYS |
|---|---|---|---|---|---|
| a. Made turns or lane changes without signaling | □1 | □2 | □3 | □4 | □5 |
| b. Intentionally stayed in the left lane of a multi-lane highway | □1 | □2 | □3 | □4 | □5 |
| c. Cut in and out of traffic | □1 | □2 | □3 | □4 | □5 |
| d. Driven through a stop sign | □1 | □2 | □3 | □4 | □5 |
| e. Driven through a red light | □1 | □2 | □3 | □4 | □5 |
| f. Intentionally driven too close to the car in front of you | □1 | □2 | □3 | □4 | □5 |
| g. Driven much faster than the other cars on the road | □1 | □2 | □3 | □4 | □5 |
| h. Driven much slower than the other cars on the road | □1 | □2 | □3 | □4 | □5 |
| i. Worn a seatbelt when in a car, truck, SUV, etc. | □1 | □2 | □3 | □4 | □5 |
| j. Focused intently on the people who are driving or riding in other vehicles | □1 | □2 | □3 | □4 | □5 |
| k. Been startled at common road sounds | □1 | □2 | □3 | □4 | □5 |

Q21 How often in the past month has a family member or friend refused to ride with you because of the way you drive?

0 □ Never
1 □ 1-2 Times
2 □ 3 or More Times

Q22 During the past 30 days how often have you been told that you drive dangerously?

0 □ Never
1 □ 1-2 Times
2 □ 3 or More Times

Q23 In the past 30 days, how often have you chased another car whose driver upset you?

0 □ Never
1 □ 1-2 Times
2 □ 3 or More Times

Q24 Please indicate how often each of the following has occurred in the past 30 days.

| | ALMOST NEVER | RARELY | SOMETIMES | USUALLY | ALMOST ALWAYS |
|---|---|---|---|---|---|
| a. Asked someone else to drive in situations when you would have normally driven | □1 | □2 | □3 | □4 | □5 |
| b. Driven in the middle of the road (straddling two lanes) | □1 | □2 | □3 | □4 | □5 |
| c. Moved to the middle of the road or onto the shoulder to avoid common small objects such as road kill, litter, manhole cover, etc | □1 | □2 | □3 | □4 | □5 |
| d. Driven erratically in tunnel or when driving under an overpass | □1 | □2 | □3 | □4 | □5 |
| e. Rerouted to avoid overpasses, tunnels, or littered roads | □1 | □2 | □3 | □4 | □5 |
| f. Moved to the median or oncoming lane of traffic to avoid small objects, traffic, or similar things in your lane | □1 | □2 | □3 | □4 | □5 |
| g. Moved to middle of the road or onto the shoulder to avoid slow drivers or traffic. | □1 | □2 | □3 | □4 | □5 |

Q25 Please indicate how often each of the following makes you feel uncomfortable, anxious, or angry:

| | NOT AT ALL | A LITTLE | SOMEWHAT | VERY |
|---|---|---|---|---|
| a. Driving near unexpected items on or near the roadside | □1 | □2 | □3 | □4 |
| b. Driving in ethnically diverse areas | □1 | □2 | □3 | □4 |
| c. Driving where there are small trucks or vans | □1 | □2 | □3 | □4 |
| d. Driving through tunnels or under overpasses | □1 | □2 | □3 | □4 |
| e. Driving in slow or stop-and-go traffic | □1 | □2 | □3 | □4 |
| f. Driving near parked cars | □1 | □2 | □3 | □4 |
| g. When other cars approach your car quickly | □1 | □2 | □3 | □4 |
| h. When your car gets boxed-in | □1 | □2 | □3 | □4 |
| i. When other cars pass you | □1 | □2 | □3 | □4 |
| j. Driving at dusk or at night | □1 | □2 | □3 | □4 |
| k. Driving at high speeds (e.g. over 55 mph) even if within the speed limit | □1 | □2 | □3 | □4 |
| l. When another car cuts in front of you | □1 | □2 | □3 | □4 |
| m. When a car pulls between your car and another car that you are traveling with | □1 | □2 | □3 | □4 |

Q26 Thinking about your answers to the above situations, how much are you bothered by the fact that you have this discomfort or anxiety

1 □ Not at All Bothered
2 □ A Little Bothered
3 □ Somewhat Bothered
4 □ Very Bothered

Q27 Thinking about driving in general, would you say that driving makes you?

1 □ Not Anxious At All
2 □ A Little Anxious
3 □ Somewhat Anxious
4 □ Anxious
5 □ Very Anxious

Q28 In the past 30 days, what weapon, if any, did you keep in your personal vehicle?(Check all that apply)

a. □ Gun *Type*:_____
b. □ Knife
c. □ Mace/Pepper spray/Taser
d. □ Explosive device
e. □ Baseball bat or club
f. □ Other - *Please Describe*: _____

Q29 How much do you feel that driving habits from Iraq or Afghanistan have carried over into your driving in America? (If you have not served in Iraq or Afghanistan, please check this box □ and skip to Part 4 below)

0 □ None
1 □ A Little
2 □ Some
3 □ A Lot

Q30 Which of the following statements best describes your situation:

My driving after deployment is:

1 □ Much better than before deployment
2 □ Somewhat better than before deployment
3 □ About the same as before deployment
4 □ Somewhat worse than before deployment
5 □ Much worse than before deployment

## Part 4: Driving In General

Q31 Thinking about driving in general, not your driving in particular, please rate how dangerous each of the following are:

| | VERY DANGEROUS | SOMEWHAT DANGEROUS | NOT VERY DANGEROUS | NOT DANGEROUS |
|---|---|---|---|---|
| a. Driving much faster than the other cars on the road | □1 | □2 | □3 | □4 |
| b. Driving erratically in tunnel or an overpass | □1 | □2 | □3 | □4 |
| c. Driving through a stop sign | □1 | □2 | □3 | □4 |
| d. Driving through a red light | □1 | □2 | □3 | □4 |
| e. Driving down the middle of road (straddling lanes) | □1 | □2 | □3 | □4 |
| f. Driving into the oncoming traffic lane | □1 | □2 | □3 | □4 |
| g. Yelling or making rude gestures at other drivers when driving | □1 | □2 | □3 | □4 |
| h. Keeping a weapon in the car | □1 | □2 | □3 | □4 |
| i. Passing a slow driver or traffic jam by driving on the shoulder | □1 | □2 | □3 | □4 |

Q32 In the three years before your most recent deployment started, were you in a car accident while driving? (If never deployed, answer for most recent three years.)

1 □ No
2 □ Yes

Q33 In the three years before your most recent deployment started, did you get a ticket for any moving violation? (If never deployed, answer for most recent three years)

1 □ No
2 □ Yes ➔ If Yes, How many violations? |__|__|

Q34 Have you ever had your driving license suspended or revoked?

1 □ No
2 □ Yes

## Part 5 Your Health

Q35 In general, would you say your health is:

1 □ Excellent
2 □ Very Good
3 □ Good
4 □ Fair
5 □ Poor

Q36 Has a health care provider ever told you that you had a head injury or concussion?

1 □ No
2 □ Yes
36a. Was this associated with a deployment to OIF/OEF?
1.□ No
2.□ Yes

Q37 Has a health care provider ever told you that you had a mild or moderate brain injury?

1 □ No
2 □ Yes
37a. Was this associated with a deployment to OIF/OEF?
1.□No
2.□Yes

☞ If you have <u>not</u> served in Iraq or Afghanistan - please skip to Part 6, on page 11

For this study, we must know who is likely to have mild traumatic brain injury or post-traumatic stress disorder from their most recent deployment to OIF or OEF. The next questions are commonly used to indicate this possibility. Your responses are untraceable. Please respond honestly. As with any question in this survey, you may skip any item.

Q38 Did you have any injury(ies) during your most recent deployment from any of the following? (check all that apply):

a. □ Fragment
b. □ Bullet
c. □ Vehicular (any type of vehicle, including airplane)
d. □ Fall
e. □ Blast (Improvised Explosive Device, RPG, Land mine, Grenade, etc.)
f. □ Other specify: _____
g. □ None

Q38a Where you in a land vehicle when any of the above injury(ies) occurred?

1 □ No
2 □ Yes

Q39b Did any injury received while you were most recently deployed result in any of the following (check all that apply):

a. □ Being dazed, confused or "seeing stars"
b. □ Not remembering the injury
c. □ Losing consciousness (knocked out) for less than a minute
d. □ Losing consciousness for 1-20 minutes
e. □ Losing consciousness for longer than 20 minutes
f. □ Having any symptoms of concussion afterward (such as headache, dizziness, irritability, etc.)
g. □ Head Injury
h. □ None of the above

Q40 Are you currently experiencing any of the following problems that you think might be related to a possible head injury or concussion? (Check all that apply):

a. □ Headaches
b. □ Dizziness
c. □ Memory problems
d. □ Balance problems
e. □ Ringing in the ears
f. □ Irritability
g. □ Sleep problems
h. □ Other specify: _____

Q41 Have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:

| | NO | YES |
|---|---|---|
| a. Have had any nightmares about it or thought about it when you did not want to? | □1 | □2 |
| b. Tried hard not to think about it; went out of your way to avoid situations that remind you of it? | □1 | □2 |
| c. Were constantly on guard, watchful, or easily startled? | □1 | □2 |
| d. Felt numb or detached from others, activities, or your surroundings? | □1 | □2 |

Q42 Were you ever told by a health care provider that you have or had PTSD associated with your OIF/OEF deployment?

1 □ No
2 □ Yes

## Part 6: About You

Q43 How old are you?

|__|__| Years

Q44 Are you...

1 □ Male
2 □ Female

Q45 Are you...

1 □ Married or Living in a marriage like relationship
2 □ Separated
3 □ Divorced
4 □ Widowed
5 □ Never Married

Q46 Are you of Latino or Hispanic origin?

1 □ No
2 □ Yes

Q47 Which of the following best describes your ethnic background:

1 □ Asian/Pacific Islander
2 □ Black/African American
3 □ Native American
4 □ White
5 □ Other: Please Describe: _____

Q48 What is the highest level of education that you have completed?

1 □ 8th grade or less
2 □ Some high school
3 □ High school graduate or GED
4 □ Trade school (Vocational, Technical, or Business School)
5 □ Some college or Associate's degree (including Community College)
6 □ Bachelor's degree
7 □ Graduate or professional degree
8 □ Other, Please Specify:_____

Please don't forget to give the enclosed packet labeled "Knowledgeable Other" to someone who is familiar with your driving and has driven with you in the past 30 days.

Thank you for your service at home and abroad, and thank you for completing this survey. If you have any additional comments you would like to make, please use the space below.

If you have any questions, please feel free to call me at 800-874-8636. Please return this survey in the stamped return envelope to

Erica Stern, Ph.D., OTR/L, FAOTA
Associate Professor
Program in Occupational Therapy
University of Minnesota
Mayo Mail Code 368
426 Church St., SE
Minneapolis, MN 55455.

<BARCODE ID>

# Post-Deployment Driving Problems: Survey of Scope and Timeline for Post-deployment Soldiers With and Without Mild Traumatic Brain Injury

**Erica B. Stern PhD[1], OTR/L, Todd Rockwood[2] PhD**

[1]Center for Allied Health Programs; [2] School of Public Health; University of Minnesota, Minneapolis, MN

## Background

Soldiers in Operation Iraqi Freedom and Operation Enduring Freedom (OIF/OEF) travel long distances to transport material and personnel and complete combat missions. To mitigate risks and limit exposure during this travel, Soldiers use specific driving maneuvers. After 12+ months of consistent use of these *combat driving* maneuvers, the behaviors become both automatic and strongly linked to a sense of control and safety. Carryover of these behaviors to American roads may endanger and create stress for Soldiers, their families and communities.

To develop efficient programs to smooth driving reintegration, we must understand the most common carryover driving behaviors and driving related anxieties, how Soldiers' perceptions of these differ from those of their family/friend, and the personal attributes or experiential factors that place Soldiers at greater risk for post-deployment driving issues. Survey data is especially pertinent to community planning, coordination with judiciary, return-to-work planning, other functional research in reintegration.

This poster discusses the data from a regional study of post-deployment driving issues (UM-IRB #0707812182, *Shifting Gears-Driving Post Deployment)* and the national study in process (PTO 75013, W81XWH-08-2-0196 ).

## Driving Behaviors

| Combat Driving | Civilian Driving |
|---|---|
| Drive in middle of road, straddle lanes | Drive on right side of road, in 1 lane |
| Drive off road to avoid potential dangers & objects | Drive only on road e.g., over manholes, road-kill |
| At tunnel/underpass –speed up & change lanes | Steady speed, stay in lane at tunnel & underpass |
| Make turns unexpectedly | Signal turns & lane change |
| No one intrudes into convoy | Other vehicles pass & pull into your vehicle's path |
| No stop for vehicles or persons | Stop for traffic & pedestrians |
| Ignore traffic signals; Military has right of way | Obey traffic signals; Often yield right of way |
| Limited or no travel alone or at night | Common to travel alone and at night |
| Weapons always in vehicle | Unarmed in vehicle |

## Regional Study: Methods

**Participants** : 198 Minnesota Soldiers

- 48 never deployed to OIF/OEF, most U-MN Army ROTC
- 150 Minnesota National Guard post-deployment
  - 58 % 30 days post-deployment
  - 42 % 60+ days post-deployment
- Family/friend matched to OIF/OEF Soldier 1x. (Subsample n= 39)
- OIF/OEF group was significantly older, had more married, were all male, and had served longer than the non-OIF/OEF group. Regression showed that only one variable significantly influenced any scale score. Younger Soldiers more likely to have higher *Violations* scale score (not discussed in this poster).

**Instrument:** 93-items. Developed with iterative input from post-OIF/OEF Soldiers, command, and PR&R reintegration specialists from the Office of The Surgeon General.

From these items, five latent variables (scale scores) were created for analytic purposes. Two, *Violations* and *Perception of Danger* are not shown in this poster.

- **Personal/Experiential Items**

  *Demographics:* age, sex, MS, education, yrs service, rank

  *Deployment:* time deployed, distance & times on road as driver vs. passenger, *driving trauma scale* (drive through enemy fire/explosion, vehicle hit by enemy fire/explosion, vehicle crash or overturn regardless of enemy action).

**Procedure:** Survey completed by

Non-deployed Soldiers 1 x

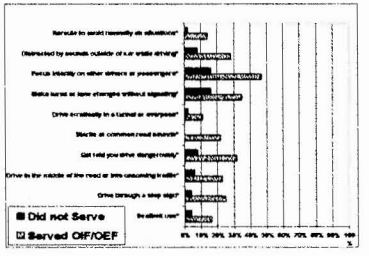
OIF/OEF Soldiers 30 – 90+ days post-deployment

## Risk Factors

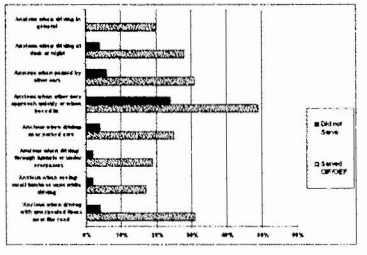
Multiple stepwise regression showed that *Driving Trauma Scale* predicted ~9% of *Driving Behavior* and *Driving Related Anxiety* Scale scores. Soldiers with higher levels of *Driving Trauma* had more post-deployment driving issues.

## Results

**1. Driving Behaviors:** Mean OIF/OEF Soldiers' *Combat Driving Behaviors* scale score 14% higher than non-OIF/OEF (t= 3.89, p<.001). Large numbers of OIF/OEF Soldiers report consistent combat driving behaviors in past 30 days (10/20 items significantly higher than non-OIF/OEF)




**2. Driving Related Anxieties:** Mean OIF/OEF Soldiers *Driving Related Anxieties* score 29% worse than non-OIF/OEF (t=5.51, p<.001). Large numbers of Soldiers reported consistent driving-related anxieties in past 30 days (9/10 items significantly higher than non-OIF/OEF)




3. **Weapons in POV:** Twice as many OIF/OEF Soldiers (52%) as non-OIF/OEF (25%) carried *weapons* in POV. Knife most common.

4. **Family/Friends:** Significantly underestimate *Driving Behavior* (t=4.82, p<.001) and *Driving Related Anxiety (t=3.81, p<.001)* scores compared to matched OIF/OEF Soldiers.

## Discussion

In this regional study, a large percentage of returned OIF/OEF Soldiers reported carryover of combat driving behaviors and driving related anxieties. Family/friends do not fully recognize their Soldier's level of combat driving behaviors and driving related anxieties. Killgore[1] found that returned OIF Soldiers who had experienced trauma during deployment were more likely to engage in risky driving behaviors. In this study, *Driving Trauma* in theatre is the strongest predictor for carryover and driving anxieties, but at ~9%, this association is not strong enough to permit a group-specific approach to the problem. Based on the regional study, driving post-deployment programming should be part of all Soldiers' and Families' reintegration.

## Next Step

The existing study's findings are limited by several factors: regional sample of only men with unknown medical status (*presumed* uninjured). The CDMRP project is surveying Soldiers from across the nation to describe the scope, factors, and timeline of driving issues, determine how these issues differently affect returning OIF/OEF Soldiers with and without mild traumatic brain injury (mTBI), and determine the types of information on driving reintegration needed by Soldiers and their family/friends. **We actively need partners to help distribute the survey to:**

- Post-OIF/OEF Soldiers without mTBI
- Post-OIF/OEF Soldiers with mTBI
- Soldiers who have not served in OIF/OEF.

If you can help toward this goal, please contact the presenter to see the surveys and discuss collaboration.

## Acknowledgements

We sincerely thank the **Minnesota National Guard** and **UMn ROTC Soldiers** who shared their driving experiences in OIF/OEF and America. *We appreciate their service at home and abroad.* We also thank **Chaplain John Morris**, for his assistance with access; **COL Jimmie Browning**, the **785th Med Co (CSC), LTC Curt Cooper (Retired), COL Mary Erickson, COL Mary Lopez, UMCenter for Survey Research**, for their help in survey development; **Bruce Center, PhD**, for his statistical analysis, and OT graduates students who worked on this project: **L Riley-Chiabotti, A Hieb, E Christiansen, J Polzin, K Wenker, O Escobar, and J Reiss. CDMRP funding W81XWH-08-2-0196**

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Appendix B

Appendix C

# Personal and Experiential Factors Associated with Driving Reintegration of Soldiers Post-deployment from OIF/OEF

Jessie Polzin, OTS, Kayla Wenker, OTS, Advisor: Erica B. Stern, PhD, OTR/L, FAOTA
University of Minnesota, Minneapolis, Minnesota

## BACKGROUND

Over a million Americans have served in the current wars in Iraq and Afghanistan (Operation Iraqi Freedom and Operation Enduring Freedom - OIF/OEF).[1] Many Soldiers returning from these wars report consistent problems with driving reintegration.[2] These include carryover of combat driving behaviors (e.g., speeding, retention of right of way, erratic driving) and driving-induced anxieties (e.g., anxiety when driving near roadway trash or in slowed/stopped traffic). To permit efficient delivery of prevention and intervention programs, it is necessary to understand if there are personal attributes and experiential factors that place Soldiers at greater or lesser risk for these driving reintegration problems. This study examines the association between OIF/OEF veterans' personal factors or OIF/OEF experience and several post-deployment driving behaviors and anxieties

## METHODS

### Participants

150 Soldiers who served in OIF/OEF
At least 30 days post-deployment

### Design

Regression analysis of an existing survey database[2,3]

### Instruments

Shifting Gear Driving Survey: 92 item survey including personal and military demographics, history of OIF/OEF driving experience. Dependent (outcome) variables asked about occurrence during past 30 days.

- ***Driving-induced anxiety***: 10 items,
  - 1 *Nearly always/always* to 4 *Never*
- ***Combat driving behaviors***: 20 items,
  - 1 *Nearly always/always* to 4 *Never*
- ***Violations while driving***: 4 items (tickets, warnings, crashes),
  - 0 *Never in past 30 days* to 3 *Three or more times in past 30 days*
- ***Appreciation of dangerousness of driving actions***: 25 items
  - 4 *Very dangerous*, 1 *Not dangerous*
- ***Carrying a weapon in their personal vehicle***: 1 item
  - 0 No, 1 Yes

### Data Analysis: Performed using SPSS 16

- Forward stepwise multiple regression analysis was used to assess impact of personal and experience variables on multi-item outcome variables
- Binary logistic regression analysis was used to assess impact of personal and experience variables on binary post-deployment ***carrying a weapon in a vehicle.***

## RESULTS

**Driving-induced anxiety (Table 1)**
Most strongly associated with exposure to trauma while driving in OIF/OEF ($t = 3.671$, $p < 0.001$) and secondarily with married marital status ($t = 1.749$, $p = 0.082$) Together, these two variables account for 11.2% of the variability of post-deployment driving-induced anxiety.

**Carryover of combat driving behaviors (Table 1)**
Most strongly associated with exposure to trauma while driving in OIF/OEF ($t = 4.044$, $p < 0.001$) and a lower level of education ($t = 2.305$, $p = 0.044$). Combined, these two experiential and personal factors account for 11.9% of the variability of carryover of combat driving behaviors.

**Violations while driving (Table 1)**
Most strongly associated with younger age ($t = -3.700$, $p < 0.001$) which alone accounted for 8.7% of the variability of this post-deployment measure

**Dangerousness while driving (Table 1)**
No variable strongly predicted Soldier's post-deployment sense of what was dangerous during driving. Married marital status neared standard significance ($t = 1.723$, $p = 0.087$), although this personal factor accounted for only 2% of the variability of this post-deployment measure.

**Carrying a weapon in a vehicle (Table 2)**
Most strongly associated with younger age ($\beta = -1.203$, $p < 0.001$), being currently married ($\beta = 0.808$, $p = 0.062$),having been deployed for a shorter period ($\beta = -0.748$, $p = 0.058$), and longer time home post deployment ($\beta = 0.694$, $p = 0.063$).

**Table 1: Forward Stepwise Regression of Post-Deployment Multi-Item Variables**

| Dependent Variable | Independent Variable | $R^2$ Change | $R^2$ Total | Significance |
|---|---|---|---|---|
| Anxiety | Trauma | 0.093 | 0.112 | $p < 0.001$ |
| | Marital Status | 0.019 | | $p = 0.082$* |
| Behavior | Trauma | 0.094 | 0.119 | $p < 0.001$ |
| | Educational Level | 0.025 | | $p = 0.044$ |
| Violations | Age | 0.087 | 0.087 | $p < 0.001$ |
| Appreciation of Dangerousness | Marital Status | 0.020 | 0.020 | $p = 0.087$* |

**Table 2: Binary Logistic Regression on *Weapon Carry***

| Independent Variable | β | Significance | Exp(β) | Odds Ratio |
|---|---|---|---|---|
| Age | -1.203 | $p < 0.001$ | 0.300 | -3.333 |
| Marital Status | 0.808 | $p = 0.062$ | 2.244 | 2.244 |
| Months Deployed | -0.748 | $p = 0.058$ | 0.473 | -2.114 |
| Time Post-Deployment | 0.694 | $p = 0.063$ | 2.001 | 2.001 |

## DISCUSSION

Personal and environmental factors explained nearly 12% of the variability in the post-deployment driving-induced anxiety and combat driving behaviors of this small sample of Soldiers'. In both cases, the strongest association was with Soldiers' having experienced driving-related trauma during deployment (i.e., an attack of their convoy, their vehicle being hit, or a crash/rollover of their vehicle). Additionally, Soldiers who had deployment driving-related trauma and were married were slightly more likely to report greater driving-induced anxiety and Soldiers with High School or less education were slightly more likely to engage in greater post-deployment combat driving behaviors. The latter parallels Hooper's Gulf War research that showed a strong association between educational level and risky driving behaviors, but fails to mirror that study's finding that being single was also significantly associated with those behaviors.[4] We could find no prior study of driving related anxiety. Being single was weakly associated with lesser appreciation of the danger of carryover driving behaviors.

Soldiers under the age of 30 reported higher levels of post-deployment driving violations, paralleling the known increased risk of younger drivers. Americans 25 years and younger have the highest rate of traffic violations, crashes, and fatalities.[5]

Several variables were associated with carrying a weapon post-deployment. Married Soldiers who were 20 years or younger who had been deployed for a year or less and had been home for 3 months or more were most likely to carry a weapon in their vehicle.

Variables such as miles of OIF/OEF driving and driving role (passenger/driver) were not significant predictors of any outcome variable.

## CONCLUSION

OIF/OEF driving-related trauma offers the strongest prediction of the outcome variables of chief importance: driving induced anxiety and carryover of behaviors. Because factors explained a maximum of 12% of post-deployment driving issues, future planning should offer programs broadly to all returning Soldiers, perhaps emphasizing the need for Soldiers with OIF/OEF driving-related trauma.

## ACKNOWLEDGEMENTS

Many thanks to the participants from the Minnesota National Guard B Company (B/1-194) and University of Minnesota's Golden Gopher Battalion - Army Reserve Officers' Training Corps (ROTC); and to Laura Riley-Chiabotti and Aspen Hieb for providing the database, Bruce Center, PhD for his expertise in statistics, Erica B. Stern, PhD, for her guidance and proficiency in research, and the University of Minnesota Occupational Therapy program for our educational and professional foundation.

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# Comparison of Self-Reported Driving Behaviors and Anxieties of OIF/OEF Soldiers at 30, 60, and 90 days Post-Deployment

Ellen Christensen, OTS, Oscar Escobar, OTS, Julie Riess, OTS, & Erica Stern, PhD, OTR/L, FAOTA

*Program in Occupational Therapy, Center for Allied Health Programs, University of Minnesota, Minneapolis, MN*

## Introduction

American Soldiers serving in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) face frequent threats while driving. To protect themselves from ambush and improvised explosive devices (IEDs), Soldiers use *combat driving* maneuvers. For example, Soldiers are conditioned to speed, and drive erratically when coming to overpasses or tunnels. They keep moving, driving off road or bumping slow civilian vehicles to avoid being slowed or stopped while in traffic[1]

Recent research has found that OIF/OEF Soldiers report carryover of these driving behaviors and driving-related anxieties when on the road in America post-deployment[2].

It is unknown how long these behaviors and anxieties remain after Soldiers return home. This study examined the timelines of driving behaviors, driving-related anxieties, perception of dangerous driving behaviors, reports of driving violations, and possession of weapons across 30, 60, and 90 days post-deployment from OIF/OEF. Soldiers' 90 day post-deployment data were then compared to survey reports of Soldiers who had never been deployed to OIF/OEF.

## Methods

**Participants**:

- 39 Soldiers, Minnesota National Guard B Company (B/1-194) with complete sets of 30,60, and 90 day surveys post-deployment from OIF/OEF. Subset from 150 subject *Shifting Gears* study database.
- 49 Soldiers, who had *not* served in OIF or OEF (non-deployed control group), most from University of Minnesota's Army Reserve Officers' Training Corps (ROTC). Data accessed from *Shifting Gears* database.

**Instrument:** *Shifting Gears Driving Survey*: 93-items. Five separate scales asking about past 30 days experiences:

- ***Driving Behavior*** 20 items
  1 *Never* to 4 *Nearly always or Always*
- ***Driving-related Anxiety*** 10 items
  1 *Never* to 4 *Nearly always or Always*
- ***Perception of Dangerous Driving Behaviors*** 24 items
  1 *Not dangerous* to 4 *Very dangerous*
- ***Driving Violations (tickets, warnings, crashes)*** 4 items
  0 *Never* to 3 *Three or more times*
- ***Carrying Weapon(s) in Personal Vehicle*** 1 item
  0 *No* 1 *Yes* (Type of weapon (s): *gun, knife, mace, explosive, or other*)

**Procedure**: Survey completed 1x by non-deployed Soldiers and at 30, 60, and 90 days post-deployment by OIF/OEF Soldiers.

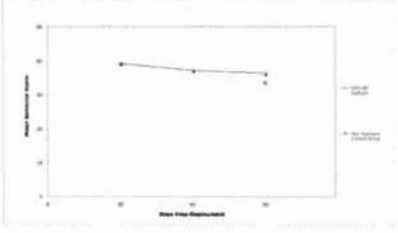
**Data Analysis:**

- Repeated-measure, one-way analyses of variance (ANOVAs) with simple post-hoc contrasts (SPSS v.15 & 16) to compare behaviors/anxieties across time.
- Independent t-tests to compare OIF/OEF Soldiers to non-deployed control group.

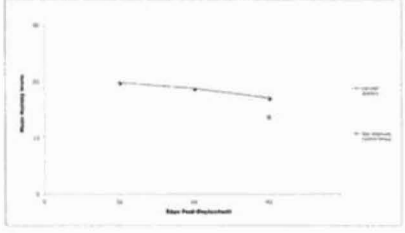
## Results

**Driving Violations** remained at similar level across the three time points ($p = .251$, $d$ 30-90 days = -.12). There was no significant difference between post-deployed Soldiers' 90 day scores and non-deployed Soldiers' driving violations (mean diff= .20; $d$= .25; p= .19; t=1.32).

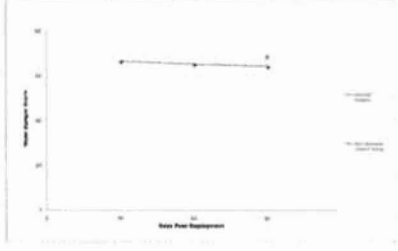
**Combat Driving Behaviors** of OIF/OEF Soldiers decreased significantly across time ($p = .01$), with large reduction between 30 - 90 days ($d$= .92). At 90 days, there was a small, non-significant difference between post-deployed and non-deployed Soldiers (mean diff= 2.82; $d$= .33; p= .09, t=1.72).



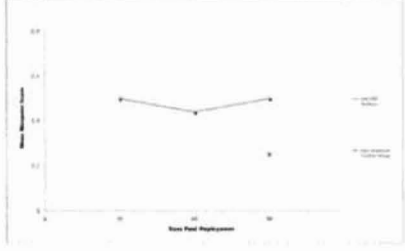
**Driving-related Anxieties** of OIF/OEF Soldiers decreased significantly across time ($p = .001$), with a large drop between 30 and 90 days ($d$= .85). At 90 days, post-deployed Soldiers had moderately higher anxiety scores than non-deployed Soldiers (mean diff= 3.47; $d$= .67; p= .004, t=3.01).



**Perception of Driving Danger** by OIF/OEF Soldiers remained at a similar level across all three time points ($p = .327$, $d$= .35). At 90 days, a significant difference remained between the level of danger that post-deployed and non-deployed Soldiers associated with driving actions (mean diff= -4.10; $d$= -.44 p= .05, t=-2.00).



**Possession of Weapons** by OIF/OEF Soldiers remained at a similar level across all three time points ($p = 1.000$, $d$=0). At 90 days post-deployment, approximately twice as many OIF/OEF Soldiers were carrying weapons in their vehicles than were the non-deployed Soldiers (mean diff= .26; $d$= .55; p= .01, t=2.52).



## Discussion

**•Did OIF/OEF Soldiers change incidence of driving issues across time?**

- OIF/OEF Soldiers had significant and large reduction in combat driving behaviors and driving-related anxieties across the 90 days reintegration.
- There were no significant changes in OIF/OEF Soldiers' perceptions of driving dangers or weapons in vehicles. This supports other studies' findings that returned Soldiers involved in physical/emotional trauma of combat have higher risk-taking when driving[3,4]

**•After 90 days home, were OIF/OEF Soldiers similar to non-deployed?**

- Even after 90 days home, OIF/OEF Soldiers had more driving-related anxieties, higher incidence of weapons in vehicles, and lower perception of driving danger, than non-deployed Soldiers.
- After 90 days home, OIF/OEF Soldiers' driving behaviors were similar to non-deployed. This contradicts regression studies of the full *Shifting Gears* data set[2]. Further study is needed to determine if this accurately reflects the trend of change, or if the difference is due to different sample characteristics between the sub-set used here and full dataset.

## Conclusion

Soldiers reintegrating from OIF/OEF have several months of carryover combat driving behaviors, driving anxieties, skewed perceptions of driving danger, and tendency to carry weapons. Although combat driving *behaviors* reduce to the level of non-deployed Soldiers, the scores do not drop to the non-deployed level until 90 days post-return. Driving anxieties, weapons in vehicles, and underestimating driving dangers are especially long lasting post-deployment issues. Returning Soldiers may benefit from both early and ongoing programs focused on safe driving reintegration to American roadways.

## Acknowledgements

We offer our heartfelt thanks to the Soldiers of Minnesota National Guard B Company (B/1-194) and the University of Minnesota's Army Reserve Officers' Training Corps (ROTC) whose participation helped define this national issue. We thank Laura Riley Chiabotti, Aspen Hieb, and Erica B. Stern for providing the database used in the study, and Bruce Center, PhD for his expertise in statistics.

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Appendix D