This is the author-manuscript version of this work - accessed from   http://eprints.qut.edu.au

Chapter 1

Stages of Change in the Australian Workplace and its Application to Driver Education

Tamara Banks, J. Davey and H. Biggs
Centre for Accident Research and Road Safety – Queensland, Australia

Introduction:

High social and financial costs are currently being incurred by both industry and society as a result of work related road incidents. It is estimated that worldwide 50 million people are injured and an additional 1.2 million people are killed annually in road crashes (WHOR, 2004). More specifically it has been estimated that in Australia, the total cost of work related road incidents may be in the range of $1 billion to $1.5 billion per annum (Wheatley, 1997) and that the average total insurance cost of a fleet incident is approximately $28,000 with costs incurred to both the company and society (Davey & Banks, 2005). Additionally, motor vehicle incidents are the most common mechanism for Australian compensated fatalities, representing 35 percent of all work compensated deaths (ASCC, 2006). In attempt to reduce the frequency and severity of work related road incidents, some organisations implement driver education.

Driver education aims to improve driver knowledge, attitudes and behaviour. The term is used broadly to cover a range of instruction and learning procedures that emphasise the cognitive processes and underlying values relating to safe driving behaviour. Although many practitioners in the occupational health and safety field assume that driver safety can be enhanced through the provision of

driver safety education, research investigating this relationship has found mixed results. For example driver education has been found to be associated with greater caution when approaching and overtaking a hazard, greater adherence to traffic signals and signs, greater visual monitoring of the driving environment, fewer traffic violations/infringements, lower risk acceptance and lower accident risk (Chapman, Underwood & Roberts, 2002; Dorn & Barker, 2005; Llaneras, Swezey, Brock, Rogers, & Van Cott, 1998; Lund & Williams, 1985). Comparatively, other studies have failed to find significant risk reductions in relation to the provision of driver education (Christensen & Glad, 1996; Katila, Keskinen, Hatakka & Laapotti, 2004; Lynam & Twisk, 1995).

It is suggested that the observed contradictory findings from past studies may be partially explained by variations between participants' readiness for change. The Stages of Change model also known as the Transtheoretical model of Change (Prochaska, DiClemente & Norcross, 1992) is a behaviour change model that offers a framework for understanding variations in readiness for change. The model suggests that individuals require different types of support based on their position within the change process as they pass through the cyclical phases of pre-contemplation (not thinking of changing one's behaviour), contemplation (seriously considering changing one's behaviour in the near future), preparation (making plans and intending to change one's behaviour in the very near future, may have started to make minor changes), action (engaged in changing one's behaviour) and maintenance (working to consolidate gains from one's changed behaviour and prevent relapse).

Originally developed in the field of psychotherapy for studying individual behaviour change, the Stages of Change model has strong empirical support in the area of individual health promotion. For example research across a range of behaviours including dietary behaviour (Campbell, et al., 1994) and mammography screening (Rakowski, et al., 1998) has found that stage matched interventions were more effective in changing behaviour than 'one size fits all' interventions. This makes intuitive sense considering that research comparing stage distributions across a range of health-related behaviours has found that in pre-action individuals approximately 40 percent of the population are in the precontemplation phase, 40 percent are in the contemplation phase and only 20 percent are in the preparation phase (Velicer et al., 1985; Laforge, Velicer, Richmond & Owen, 1999). This distribution pattern would suggest that a combination of initiatives targeting awareness raising, discussing how changes could be made and making plans to change may be an effective approach to improving work related road safety. It also may account for previous research findings that driver training is not effective. If driver training is focused as a single action orientated initiative and has not prepared individuals by creating the conditions necessary for change, it may only be catering to the needs of approximately 20 percent of pre-action employees. The Stages of Change model could be used in organisations to design driver training programs that are appropriate to managers and employees readiness for change.

In recent years the model has started to be applied internationally to organisational change in the areas of ergonomics and health promotion (Haslam, 2002; Prochaska, Prochaska & Levesque, 2001). A case study of health and safety

appraisal within an English manufacturing company identified that the stages of change model provided a useful framework for assessing attitudes and beliefs and assisting in recognising individual and organisational readiness to change (Barrett, Haslam, Lee & Ellis, 2005). Additionally the model provided a framework for explaining the observed effectiveness of a cattle handling injury prevention program in New Zealand. Interviews with approximately 1,500 farming personnel revealed that awareness raising methods including leaflets and videos were most effective in transitioning farmers from contemplation to action. Alternatively field days that provided farmers with an opportunity for tailored advice were more effective in transitioning farmers from action to maintenance (Slappendel, 2001 as cited in Haslam, 2002).

This paper will expand upon recent organisational behaviour change research by exploring the utility of the Stages of Change model as a framework for understanding employee road safety behaviour change. Firstly it is hypothesised that the Stages of Change model will provide a framework for identifying employee readiness to engage in work-related road safety behaviour change. Secondly it is hypothesised that the model will provide a framework for explaining employees' perceived effectiveness of work-related road safety initiatives. Finally, this paper will suggest how practitioners can apply the stages of change framework to tailor driver training programs to most effectively meet client needs.

Method

Participants

To allow research findings to be generalised to a wide range of organisations, two contrasting organisations were recruited to participate in this research. Organisation A was a not for profit State based provider of residential and community services. It employed approximately 2,000 staff and was supported by a network of approximately 500 volunteers. Organisation A operated a fleet of approximately 200 vehicles. In comparison, Organisation B was a for profit National utilities provider with a workforce of approximately 35,000 employees. The organisation was jointly owned by the Australian Government and private shareholders. Organisation B operated a fleet of approximately 15,000 vehicles. Both organisations serviced customers in urban, rural and remote areas of Australia and therefore required their employees to operate vehicles in a range of environments.

Interviews were conducted with five employees from each of the organisations. The selection of participants was a convenience sample and was ultimately determined by the employer. Efforts however were made to obtain a random and representative sample within this real-world context. Participating organisations provided access to both male and female employees from a range of roles and levels of seniority within their organisation. Participants' roles included Fleet Manager, Occupational Health and Safety Manager, Department Manager and operational employees who were required to drive as part of their work.

Interviews

A semi-structured interview schedule was developed to explore the utility of the Stages of Change model as a framework for understanding employee road safety behaviour change. Previous research suggests that it is possible to assess stage of change via individuals' responses to a small number of questions (Haslam, 2002; Haslam & Draper, 2000). Based on adaptations from previous research (Barrett, Haslam, Lee & Ellis, 2005; Whysall, Haslam & Haslam, 2006), combinations of open and closed questions were developed. In some cases several questions were asked at each stage to elicit sufficient information to identify employees' stage of change. Interview participants were also asked to comment on any work-related road safety initiatives they were aware of that their organisation was intending to or already engaging in. The formality and depth of interview questions was varied to suit the employees' level of seniority and involvement in driver safety initiatives. The following core questions were asked in this order until a negative response was obtained. The last positive response indicated the employee's stage of readiness for change.

1. Are you aware of any work-related road safety risk? (Yes = continue, No = precontemplation)
2. Are you planning to take any action to reduce work-related road safety risk in the next 6 months? (Yes = continue, No = precontemplation)
3. Do you have any definite plans to reduce work-related road safety risk in the next month? (Yes = continue, No = contemplation)
4. Have you taken any deliberate action to reduce work-related road safety risk? (Yes = continue, No = preparation)
5. Are you currently doing anything to maintain work-related road safety within your organisation? (Yes = maintenance, No = action)

To explore whether employees' perceived effectiveness of safety initiatives was related to their stage of change, interview participants were asked to comment on any work-related road safety initiatives they had experienced in their organisation.

Several steps were taken to maximise the integrity of the interview data collected. Firstly the interview schedule was piloted and refined based on feedback from employees not participating in the main study. Secondly interviews were conducted face-to-face in a private office on the premises of each organisation to minimise distractions and misinterpretations of information. Thirdly, employees were interviewed individually to minimise any contamination of data arising from potential group bias. Fourthly, it was stressed that participation was voluntary and confidential to encourage participants to openly report their beliefs and behaviours. Finally, consent was sought from participants for the interview to be recorded and notes to be taken during the session. All recorded data was transcribed verbatim to ensure accuracy.

Analysis

A three-phase approach as described by Miles and Huberman (1994) was adopted to analyse the transcribed data. Firstly data was organised via cutting and pasting

material into meaningful collections that corresponded with the interview questions. Secondly, emerging themes were identified and patterns within and between themes were explored. This phase involved summarising the data under each theme and selecting verbatim quotes to illustrate the themes. Thirdly, conclusions were drawn after interpretations of the data were verified against the interview transcripts and existing literature.

Results

An analysis of the interview transcripts suggests that the five core questions provided a useful starting point for classifying employees' stage of change. However in this research, the five questions were not sufficient to distinguish between adjoining stages for some participants. With the inclusion of additional probing questions it was identified that the Stages of Change model could provide a framework for classifying employee readiness to engage in work-related road safety behaviour change.

Organisation A

Within Organisation A, it was identified that the observed stage of readiness varied between individuals at the management level and between the levels of managers and employees. Interviews indicated that managers (n=3) varied between the preparation and action stages of readiness. All managers indicated an awareness of their organisation's exposure to work-related road safety risks. Reported risks included both general road safety risks and risks that could be considered specific to their organisation. Generic risks reported included wildlife, visibility, road trains, fatigue and high exposure with reports of some employees driving up to 70,000km per annum. Organisation specific risks pertained more to the transporting of clients. For example one manager reported that some clients "…*might just grab the hand brake or grab the wheel. We've had a couple of grab the wheel situations. We had a towel over the head the other day while the driver was driving. So we have a few young people that pose a risk with our cars...*" Although all managers believed that that their views of risk were shared by other Mangers, some felt that the lower level employees may not be aware of the risks. For example when talking about road safety initiatives one manager commented "…*I think management will embrace it, but the next couple of levels will struggle because the people I know are still saying we're about doing this and our cars getting dinted. You know, I was in a hurry. Doesn't really matter…*"
At an organisational level managers' comments indicated desires and intentions to enhance work-related road safety using a range of initiatives in the very near future. For example "…*I want to have a new fleet management system where we do record the data that will enable us to manage and then have appropriate consequences for their actions…*' and "…*on my to do list is writing a fleet policy…*" These comments would suggest that managers are currently operating in the preparation stage for some aspects of driver safety. It was also reported that some driver safety initiatives have recently been introduced in the

organisation. For example consideration of safety features when selecting vehicles, monitoring vehicle servicing, fitting cargo barriers in all station wagons and promoting road safety. Managers reported engaging in some work-related road safety behaviours at a personal level for example "…*watch other drivers is the first thing I always do...*" and at an organisational level include "…*making sure you haven't got projectiles in the car and when you're hanging clothes up, to hang them on the right rear, which I just can't tell you how many people I keep pulling up on that. They hang them on the left rear and if you're looking to see who's on your left, there's no way. It totally blocks your vision…*" and "…*we have 4-wheel drives in some of our residences. So we've had our staff in those houses do 4-wheel drive classes and road safety classes as part of their induction…*" These comments would suggest that managers are currently operating in the action stage for some aspects of driver safety. Managers agreed that while some steps have been taken in the last couple of months, that there was room for improvement in the management of work-related road safety risks within their organisation. This is illustrated by one manager's comment that "…*I think we've got a long way to go in terms of providing better training and information to people who are driving...*"

When asked about work-related road safety initiatives in their organisation, the managers reported mixed beliefs about the effectiveness of current awareness raising initiatives. Based on previous discussions with subordinates, one manager believed that the regular road safety posters, emails and information provided on their organisation's intranet was effective because it increased awareness without forcing employees to go to safety meetings or training. This manager commented that "…*our staff don't talk about what they learnt at the 4-wheel drive course, but you'll go to a staff meeting and someone will say, "Hey, have you seen that thing about us (on the intranet)" - it's like oh my god, you read it…*" In comparison another manager believed that the effectiveness of information bulletins to raise awareness of road safety risk was limited. This manager noted that "…*There's been a couple of information bulletins go out on it, but I'm not actually - I can't recall right now what was actually in it. I don't think people stop to take a lot of notice of it...*" Managers also identified a lack of understanding within the organisation as a key barrier in trying to implement road safety initiatives. Managers felt that vehicle incidents were not currently treated as seriously as other health and safety incidents and anticipated resistance when attempting to introduce a vehicle incident monitoring database. This was illustrated through comments such as "…*it will be why do you want to make the people do that? That's extra work, you know. All they did was reverse into a post, you know. They didn't hurt anybody…*"

Within Organisation A the interviews indicated that employees (n=2) were operating in the precontemplation stage of readiness. Unlike the managers that recognised both general and organisation specific road safety risks, only general road safety risks were acknowledged by the employees. Reported risks included driving long distances, mobile phone use, high volume of traffic on the roads and other driver's lacking good driving ability. It was also noted that management must consider road safety risks to be a significant issue because it was discussed at a quarterly senior meeting. Despite both employees being aware of

driving risks, neither employee reported intentions to change their driving behaviour. For example one employee commented that "…*I haven't had any damage to the car in the last seven years. So I've done pretty well. So I can't see any way of improving what I do as such. That would probably change if I had an accident…*"

When asked to comment on any work-related road safety initiatives they had experienced in their organisation, the employees reported the presence of many road safety posters displayed in their workplace. While they thought these were beneficial, they were not considered to be sufficient. For example one employee commented "…*you can't just send out an e-mail, put up a poster. You really - I mean, ultimately, people should be given specific training, driver instruction for change to happen, people have to be aware of the need for change, they have to have a desire for change and they have to know - and then they have the knowledge of how to change. Then they have to have the ability of how to change and then they have to have some reinforcement to make the change stay to stop them bouncing back to the old way…*"

Organisation B

Within Organisation B the interviews indicated that managers (n=2) and employees (n=3) were operating in the maintenance stage of readiness. Both managers and employees indicated an awareness of their organisation's exposure to work-related road safety risks. Reported risks included both general road safety risks and risks that could be considered specific to their organisation. Generic risks reported included wildlife, poor road conditions, fatigue, driving in isolated areas, travelling long distances and reduced concentration when answering phone calls via hands free kits. Organisation specific risks pertained more to the nature of the work demands. For example one manager recognised that employees "…*might get called out of bed at 2 or 3 o'clock in the morning to drive long distances so sleep deprivation comes into it…*"

Both managers and employees reported that their organisation has continued to roll out road safety initiatives for several years. Examples of reported initiatives include a driver awareness campaign featuring stickers on cars stating that the organisation values safety, a driver profiling tool to identify high risk drivers, following employees up on infringement data, considering safety features when selecting vehicles, monitoring vehicle servicing, fitting cargo barriers in all station wagons and enhancing awareness by featuring road safety posters, promoting road safety around holidays and including fleet safety topics in the monthly Fleet Newsletter. Managers additionally commented on plans to continue enhancing road safety behaviours by updating current initiatives and continuing to introduce new initiatives. Further evidence that Organisation B was operating in the maintenance stage was illustrated by employee comments pertaining to engaging in road safety behaviours. Reported behaviours included using cruise control to manage speeding, slowing down to allow for Kangaroos potentially crossing the roads in the afternoons, taking a slower more careful approach when

in the city, performing safety checks on vehicles and actively participating in the monthly Health and Safety meetings.

When asked about work-related road safety initiatives in their organisation, both managers reported that driver safety was considered to be a health and safety issue and that they perceived current safety initiatives to be effective. For example "…*I think it's just a matter of improving on what we've already got…*" and "…*they're amongst the best that you'll see, no doubt about that…*" Alternatively employees had mixed opinions about the effectiveness of current initiatives. For example one employee described how they believed that the current safety meetings were working well as they provided a great opportunity to present and trouble shoot safety concerns as a team. Another employee reported that "…*safety changes normally impact with a negative. Normally, changes will be to not drive as long or far, but increased work loads always conflict. All layers of Management are aware of the situation about staff shortages and extra distances to travel. I believe the company does have a commitment to driver safety but is willing to overlook its own policy when it comes to a situation of resources and money…*" This statement would suggest that current initiatives provided limited advice on how to juggle the potentially conflicting requirements of production and safety.

Discussion

This paper demonstrates that the Stages of Change model provides a useful framework for understanding employee readiness for road safety behaviour change. Additionally perceptions pertaining to initiative effectiveness were found to vary in relation to an individuals' stage of readiness. More specifically in organisation A, although managers were operating within the preparation and action stages, employees were operating in the precontemplation stage. Managers identified employee resistance to implementing action initiatives as a potential barrier. The Stages of Change model would suggest that employee resistance to change may occur when safety initiatives are not targeted at an appropriate level for employees' readiness for change. The selection of an inappropriate level may arise due to differences in readiness for change between managers and employees. When rolling out safety initiatives, managers have often previously spent much time in the contemplation and preparation phases. Understandably, managers are then ready for action and often attempt to impose action initiatives upon employees. Alternatively, employees may not have previously considered the risks of current practice or the benefits of new safety initiatives. They are often not prepared for change and are therefore slow to respond or may even resist the change initiatives. Individuals in organisation A generally believed that current initiatives aimed at increasing awareness of road safety risks were beneficial, however they were not considered to be sufficient. Based on the Stages of Change model it is suggested that safety initiatives in organisation A should continue enhancing current understanding and commitment but also go further in providing practical information and support to transition employees from a precontemplative stage towards action.

In comparison, in organisation B both managers and employees were operating in the maintenance stage of readiness. Overall managers and employees perceived the organisations current safety initiatives including ongoing advice and practical information to be effective. However barriers to maintaining safe driving were identified including conflicts arising between reaching production targets with increased work loads while adhering to safety policies and procedures. Based on the Stages of Change model it is suggested that safety initiatives in organisation B should further support employees to achieve and maintain safe driving behaviour through methods such as ongoing advice about how to resolve driving safely when faced with competing production goals, performance feedback and skills training. The organisation should also continue to monitor employees' behaviour to identify any early signs of behaviour relapse.

Based on this research it is suggested that the Stages of Change model could be used by practitioners to design driver behaviour and training methods that are appropriate to managers and employees readiness for change. Examples of how the Stages of Change framework could be applied to guide the design of driver education are outlined below. In the *precontemplation stage* employees would see no problem with their current road safety behaviour and express no intention to change. In this stage individuals need to be persuaded that unsafe driving behaviour needs to be addressed. The model would suggest that attempts to impose action orientated driver education on precontemplative individuals may only achieve partial success as a personal understanding of the risks and a desire to engage in safe behaviours has not first been achieved. To help transition employees from a precontemplative to a contemplative stage driver education should focus on raising awareness of work-related driving risks.

In the *contemplation stage* employees would be aware of the risks associated with work-related driving and the need to adopt safe behaviours. Contemplative individuals would be making long term plans to reduce and manage their road safety risk. To help transition employees from a contemplative to a preparation stage driver education should focus on providing educational material designed to reinforce their motivation to adopt safe behaviours and outline what is involved in adopting safer driving behaviours.

In the *preparation stage* employees would be intending to take action in the very near future. To help transition employees from a preparation to an action stage driver education should focus on providing practical information and support in learning new skills. Barriers to change should be resolved, and individuals should be encouraged to make specific plans through goal setting or contracting to foster employee commitment and ownership of safe driving behaviours.

In the *action stage* employees would be modifying their behaviour or environment to manage work-related road safety risks. Individuals in this stage require support to achieve new safety behaviours and to maintain modified behaviours. To facilitate commitment to the modified behaviours and help transition employees from an action to a maintenance stage, driver education should focus on providing ongoing advice, feedback and skills training.

In the *maintenance stage* employees would have been engaging in safety behaviours over a prolonged period of time. To facilitate employees remaining in

the maintenance stage, driver education should focus on consolidating the gains made and preventing relapse. This can be achieved through the provision of ongoing advice, feedback and training and the monitoring of employees for early signs of behaviour relapses.

It is important to note that employees may relapse to an earlier stage regardless of their current stage of change. To target relapsed employees that have failed to continue engaging in work-related road safety behaviours, driver education should support the progression back through the stages towards action and maintenance. Driver education should aim to discover the barriers that led to the employee ceasing safe practices and to motivate the employee to re-engage in safe practices through the provision of tailored information, training and feedback.

This research paper builds upon previous literature pertaining to driver education by identifying how the Stages of Change model can be applied as a useful framework to guide the development of driver education programs. Based on the model it is suggested that providers of driver education for organisations could make a brief assessment during project negotiation of managers and employees readiness for change. Based on their assessment, providers could then determine the most appropriate structure and content of driver education to effectively meet the needs of their client. By adopting a stage matched approach to driver education, providers may be able to reduce change resistance and accelerate employee movement towards the action and maintenance stage of work-related road safety behaviours. Due to the small participant sample size, further research should be conducted to validate these findings with a larger number of employees within case study organisations and across a greater range of organisations to enhance the generalisability of research findings.

References

Australian Safety and Compensation Council (2006). *Compendium of workers Compensation statistics Australia 2003-04*. Canberra: Commonwealth of Australia

Barrett, JH, Haslam, RA, Lee, KG and Ellis, MJ (2005), Assessing attitudes and beliefs using the stage of change paradigm – case study of health and safety appraisal within a manufacturing company. *International Journal of Industrial Ergonomics, 35,* 871-887

Campbell, MK, DeVellis, BM, Strecher, VJ, Ammerman, AS, DeVillis, RF and Sandler, RS (1994), Improving dietary behaviour: The effectiveness of tailored messages in primary care settings. *American Journal of Public Health, 84,* 783-787

Chapman, P, Underwood, G and Roberts, K (2002), Visual search patterns in trained and untrained novice drivers. *Transportation Research Part F: Traffic Psychology and Behaviour, 5*(2), 157-167

Christensen, P and Glad, A. (1996), *Mandatory course of driving on slippery roads for driver of heavy vehicles. The effect on accidents. TOI Report 334/1996.* Oslo: Transpotokonomisk institutt

Davey, J and Banks, T (2005), *Estimating the Cost of Work Motor Vehicle Incidents in Australia*. Paper presented at the Australasian Road Safety Research Policing Education Conference, Wellington, New Zealand

Dorn, L and Barker, D (2005), The effects of driver training on simulated driving performance. *Accident Analysis and Prevention, 37*(1) 63-69

Haslam, RA (2002), Targeting ergonomics interventions—learning from health promotion, *Applied Ergonomics, 33,* 241–249

Haslam, C and Draper, ES (2000), Stage of change is associated with assessment of the health risks of maternal smoking among pregnant women. *Social Science Medicine, 51*, 1189-1196

Katila, A, Keskinen, E, Hatakka, M and Laapotti, S (2004), Does increased confidence among novice drivers imply a decrease in safety? The effects of skid training on slippery road accidents. *Accident Analysis and Prevention, 36,* 543-550

Laforge, RG, Velicer, WF, Richmond, RL and Owen, N (1999), Stage distributions for five health behaviours in the USA and Australia. *Preventative Medicine, 28*, 61-74

Llaneras, RE, Swezey, RW, Brock, JF, Rogers, WC and Van Cott, HP (1998), Enhancing the safe driving performance of older commercial vehicle drivers. *International Journal of Industrial Ergonomics, 22*(3), 217-245

Lund, AK and Williams, AF (1985), A review of the literature evaluating the defensive driving course. *Accident Analysis and Prevention, 17*(6), 449-460

Lynam, D and Twisk, D (1995), *Car driver training and licensing systems in Europe. TRL Report 147*. Crowthorne, UK: Transport Research Library.

Lynn, P and Lockwood, C (1998), *The Accident Liability of Company Car Drivers, TRL Report 317*. Berkshire: Transport Research Laboratory

Miles, MB and Huberman, AM (1994). *An expanded source book. Qualitative Data Analysis*. London: Sage Publications

Prochaska, JO, DiClemente, CC and Norcross, JC (1992), In search of how people change: Applications to addictive behaviors. *American Psychologist, 47*(9), 1102-1114

Prochaska, JM., Prochaska, JO and Levesque, DA (2001), A transtheoretical approach to changing organizations. *Administration and Policy in Mental Health, 28*(4), 247-261

Rakowski, W, Ehrich, B, Goldstein, M, Rimer, B, Pearlman, D, Clark, M, Valicer, W and Woolverton, H (1998), Increasing mammography screening among women aged 40-74 by use of a stage-matched, tailored intervention. *Preventative Medicine, 27,* 748-756

Velicer, W, DiClemente, C, Prochanska, J and Brandenburg, N (1985), Distribution of smokers by stage in three representative samples. *Preventative Medicine, 24*, 401-411.

Wheatley, K. (1997). An overview of issues in work-related driving. In Staysafe 36: Drivers as workers, vehicles as workplaces: Issues in fleet management. (Report No. 9/51). *Ninth report of the Joint Standing Committee on Road Safety of the 51st Parliament*. Sydney: Parliament of New South Wales, 15-24.

Whysall, Z, Haslam, C and Haslam, R (2006), Implementing health and safety interventions in the workplace: An exploratory study. International Journal of Industrial Ergonomics, 36, 809-818

World Health Organization (2004). Road Safety: A public health issue. Accessed 6/12/2006 at www.who.int/features/2004/road_safety/en/print.html