

Road safety messages tailored for young adults: Using the Internet and encouraging protective passenger behaviour.

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Abstract

Young drivers are at higher risk of crashes than other drivers when carrying passengers. Graduated Driver Licensing has demonstrated effectiveness in reducing fatalities however there is considerable potential for additional strategies to complement the approach. A survey with 276 young adults (aged 17-25 years, 64% females) was conducted to examine the potential and importance of strategies that are delivered via the Internet and potential strategies for passengers. Strategies delivered via the Internet represent opportunity for widespread dissemination and greater reach to young people at times convenient to them. The current study found some significant differences between males and females with regard to ways the Internet is used to obtain road safety information and the components valued in trusted road safety sites. There were also significant differences between males and females on the kinds of strategies used as passengers to promote driver safety and the context in which it occurred, with females tending to take more proactive strategies than males. In sum, young people see value in Internet delivery for passenger safety information (80% agreed/ strongly agreed) and more than 90% thought it was important to intervene while a passenger of a risky driver. Thus tailoring Internet road safety strategies to young people may differ for males and females however there is considerable potential for a passenger focus in strategies aimed at reducing young driver crashes.

Keywords: passenger, young adult, internet delivery, education

Introduction

In Australia, and many other countries, young adults are significantly overrepresented among those killed or seriously injured in motor vehicle crashes (MVCs)^{1,2}. In Queensland in 2004, young adults aged between 17 and 24 years represented 28% of MVC fatalities however the age group represents only 11 percent of Queensland's population³. While more recent data shows a trend of reduced young adult fatalities in Queensland⁴, MVCs represent a significant cost to the Australian community and improving the safety of young people on the roads is a major priority across many jurisdictions.

The crash risk for young people is compounded by the presence of passengers. In a US study, researchers found there were young passengers in 85% of young driver fatality crashes⁵. There are also disproportionately more young adult passenger fatalities compared with passengers of other ages⁶. Research has also shown that the presence of young adult passengers with a young driver increases the likelihood of crashes^{7,8} and the risk increases further with the number of same-age peer passengers, particularly for young males⁹.

It is well recognised that the presence of male passengers is associated with a higher crash risk for their young drivers. Figures from the fatal road crash database from the Australian Transport Safety Bureau¹⁰ showed that passenger fatalities among females was around one-third of all fatalities for those aged 16 to 20 years (between 2006-2010). MVC injury claimant data shows that young women, aged 16 to 25 years had a rate of claims at 54%. The figures suggest, that although the problem is significant for young men, it is also important to consider for young women¹¹.

One common approach in many jurisdictions to reduce crashes is to implement a graduated driver licensing (GDL) system. The systems place a number of restrictions on the novice driver with many including passenger restrictions. For example, in Queensland, young novice drivers are not permitted to carry passengers at night (11pm-5am) excluding family. While there is much variability in what constitutes GDL across different jurisdictions, the approach has generally been shown to be effective¹². GDL effectiveness is thought to improve with adequate enforcement of the regulations, for example, 80% of Californian young people reported violating passenger restrictions whilst police reported a lack of GDL enforcement programs in this region¹³. Such findings, together with the current rates of MVCs and subsequent injuries, indicate there is a definite need to complement the current GDL approaches.

Williams et al.⁹ suggests that although peer passenger restrictions are effective, legislative measures should be accompanied by other road safety initiatives, with a view to changing attitudes and behaviour. Young adults' attitudes and behaviours are highly influenced by their perceptions of what peers accept and expect¹⁴. However, research into the mechanisms underlying the high crash rates of young adults and the role of passengers have traditionally focussed on the negative influence of peer passengers' and associations with risky driving^{15,16}. Peer social influence however can also be protective by deterring negative behaviour¹⁷⁻⁹. Developing road safety strategies aimed at young adult peer passengers that facilitate positive social influence regarding safe driving practices, may encourage young adults to intervene

in risky driving and motivate young drivers to engage in safer driving behaviours to protect themselves and their peers.

Such an opportunity to intervene in the peer relationship represents a potential complement to current graduated driver licensing legislative approaches as young people favourably view looking out for their mates¹⁷. Much of the research in the area of peer and passenger protection focuses on preventing drink driving (see Wolfenger et al.¹⁸) with the findings showing that young people are willing to intervene¹⁹.

In order to promote positive peer behaviour, the message delivery should be relevant to the target group, use a delivery method that is developmentally and culturally appropriate, and be evidence-based²⁰. Perry²¹ suggests that there is a critical stage of program development around creating and constructing interventions with an understanding of the local context. Growth in access to, and use of, the internet has led to a corresponding increase in the number of web-based intervention programs aimed at health-related behaviour change. Strategies delivered via the internet represent an opportunity for widespread dissemination, greater reach to young people at times convenient to them and with potential links with existing material. It thus represents an option for promotion of the messages of protecting friends. While there are a number of websites for young drivers that provide road safety information, there is an increasing body of literature that describes the evaluation of web- and computer-based programs moving beyond simple information provision and targeting behaviour change in health risk behaviours²². Many of these have shown success in changing knowledge of and attitudes to risk-taking and highlight the potential for the internet to be a source of dissemination for behaviour change programs rather than supplying information only.

The current study sought to determine web-based content and message delivery components that might inform a passenger safety program. In addition the research seeks to better understand the elements of messages that could improve the safety of young drivers using positive influences from passengers.

Method

Participants: There were 276, 17-25 year old ($M = 19$ years) participants, 35% of these were enrolled in a first year psychology course (receiving course credit for participation). The remaining participants were enrolled in other Faculties across the university or were recruited using a snowballing technique with *Facebook*TM. The majority of participants highest level of education was Year 12 (78%). There were more females than males (75%) and more participants were on the P phase of licensure (46%, 23% had a learner's permit and 29% had an open licence). In Queensland, young people are eligible for a Learner permit at 16 years, and first stage Provisional at 17 years.

Measures & Procedures: Participants were asked a number of questions related to their web use, protecting friends as passengers and demographics. They were asked about internet use, including, internet searching patterns, perceptions about potential senior student web-based road safety programs including important components and trust. These measures were refined for the target group from those used in a previous survey with senior school students²². Further with regard to passenger

intervening behaviour participants were asked about potential responses to friend's risky driving behaviour. Participants reported on a 10-point Likert scale (1, unlikely to 10, likely) whether they would likely undertake particular strategies. They were also asked about their likelihood of intervening in friends' (i) speeding (ii) drink driving and (iii) unsafe driving on a 7-point Likert scale [(1) strongly disagree to (7) strongly agree].

All procedures followed the approved protocol of the University Human Research Ethics Committee. Participants were recruited through the Queensland University of Technology psychology classes, through presentation at university lectures and a snowballing technique with *Facebook*TM. Recruitment involved promoting the website address of the survey. Participants could thus complete the survey at a time most convenient to them.

Findings

Obtaining road safety information: The young adults indicated that they did not often search the internet for 'road safety information' (70% indicated they 'never' did). However there were many who searched for transport information that has a road safety component. The majority of male and female participants had searched for information about licensing. The majority of males had also looked for information on car maintenance and females had also sought information on driver training (e.g. defensive driving courses), road rules and speeding. Other areas of interest to a large proportion of females included passenger restrictions, other driver training initiatives and again car maintenance. Searches in each of these areas were undertaken by around half of the respondents at some time in the previous three months (see table 1).

Table 1. Percent of male and female respondents who search for specific transport issues

Source topic ¹	Males			Females		
	Never	<1 in 3 months	>1 in 3 months	Never	<1 in 3 months	>1 in 3 months
Licensing	16	63	21	14	64	22
Drink driving	66	26	8	60	31	9
Drug driving	81	10	9	71	23	6
Passenger restrictions*	71	19	10	51	40	9
Driver training (defensive driving courses)	64	26	10	49	43	8
Driver training (other)*	64	22	14	51	40	9
Road rules	58	30	12	43	43	14
Fatigue*	85	8	7	70	25	5
Speeding	73	19	8	49	43	8
Car maintenance	44	34	22	52	34	14

Note. Missing data <5%

¹scoring options were 1/ week, 1/ month, 1/ 3 months (coded as >1 in 3 months); 1/ year, 1 or 2 times ever (coded as <1 in 3 months); never, significance testing between the three groups was undertaken using chi-squared tests, significant chi-squared values at $p < .05$ were $\chi^2 = 7.0$ (driver training), $\chi^2 = 8.0$ (fatigue), $\chi^2 = 8.9$ (passenger restrictions) and in all cases the standard residual values indicated males rarely sourced information about these issues.

Many young adults searched using *Google* however other sources of information included recommendations from family and friends and educational institutes and to

a lesser extent government resources that were not web-based (see table 2). Females were more likely than males to source information from friends/ family ($t(264)=-2.3, p<.05$), other media ($t(264)=-2.0, p<.05$) and educational institutes ($t(264)=-2.3, p<.05$).

Table 2. Percent of male and female respondents using access strategies

Source search	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Google	3.6	0.9	3.7	0.7	3.7	0.7
Family & friends	1.9	1.1	2.5	1.0	2.3	1.0
Other websites	1.9	0.9	2.3	0.9	2.2	0.9
TV & other media	1.8	0.9	2.3	1.0	2.1	1.0
Educational institutes	1.9	0.7	2.4	1.0	2.3	1.0
Government resources	1.5	1.4	2.0	0.9	1.8	0.9

Note. Missing data <5%. Scored on a 1-4 Likert scale from 1-Never to 4 –Mostly. Note significance testing was not undertake

Internet delivery: While the young adults believed that an interactive road safety website would be good for senior high school students, many also reported that they would have used such a website at school and there were also young adults reporting they would have used such a website at school even if it was not for their school work (see table 3).

Table 3. Mean value in a school-based road safety program

	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Good idea	5.2	1.4	5.2	1.6	5.2	1.5
Likely to use	3.7	1.8	4.3	1.6	4.1	1.7
Likely to use only for school work	5.7	1.3	5.7	1.7	5.7	1.7

Note. Missing data <5%, scored 1 (strongly disagree) - 7 (strongly agree)

Young adults were also asked to identify the context in which they could trust a website; key features included, evidence for the claims made, previous positive experience, link to a trusted or government website and parental recommendations (see table 4).

Table 4. Mean level of trust with specified website components included

	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Friend recommended	4.9	1.6	4.9	1.5	4.9	1.5
Parent recommended	5.3	1.7	5.3	1.5	5.3	1.6
Identify developer/ maintenance	5.2	1.5	5.3	1.5	5.2	1.5
Linked to trusted site	5.1	1.5	5.5	1.5	5.4	1.5
Reported in print/ other media**	4.6	1.6	5.4	1.4	5.2	1.5
Provided evidence	5.7	1.6	5.8	1.3	5.7	1.4
Positive previous experience	5.7	1.5	5.8	1.3	5.7	1.4
Government run	5.3	1.7	5.7	1.5	5.6	1.6

Note. Missing data <5%, scored 1 (strongly disagree) - 7 (strongly agree), ** $t(264)=-3.86, p<.01$.

Young adults compared features of a website that would be beneficial for senior school students and beneficial for them (see table 5). All features were seen to be more beneficial for senior students than for themselves. More commonly it was more

important for students compared with themselves to have animation, quizzes and video. It was important for both age groups to have accurate information.

Table 5. Percent of male and female respondents who report potential web components would be beneficial to themselves and beneficial to senior school students

	Target audience senior students			Target audience young adults			Totals diff.
	Males	Females	Total	Males	Females	Total	χ^2
Internal search feature	84	84	84	73	73	73	11.2**
Animation	73	81	79	34	39	39	12.2**
Video	85	89	89	61	63	62	ns
Quizzes	83	88	86	42	47	45	ns
Ask professionals	63	74	72	48	59	56	11.2**
Forums	61	69	67	30	36	35	ns
Personal feedback	64	69	68	51	47	48	20.3**
Tailored information	48	64*	59	37	46	43	26.1**
Printable information	70	86*	81	55	69	66	8.1**
Accurate information	86	88	87	75	80	79	5.4*
Date updated	70	77	75	61	73	70	16.5**

Note. Missing data <7%, *p<.05, **p<.01, chi-squared tests were used to calculate statistical significance on the differences between male and female responses for each component within the target groups (tailored info, χ^2 5.0; print info, χ^2 7.8, standardised residuals showed males were less likely to agree). Chi-squared tests were used to calculate statistical significant differences between importance for senior students compared with young adults, the standardised residuals showed less likelihood of agreement for either was the significant cell except animation, personal feedback, tailored information, whereby the significantly different cell was to include the feature for senior students.

Protective Messages: The young adults were asked to indicate how likely it is that they would undertake particular behaviours in response to friend's risky driving. There were a greater proportion of young adults who believed that they would likely try more active and direct strategies, for example, 'say something to make them stop' car (see Table 6). Further females were more likely than males to monitor alcohol use and not give attention (ignore them).

Table 6. Percent of male and female respondents who would use protective strategies in response to unsafe driving of their friends

Strategy	Before driving					In car				
	Unlikely M	Likely F	Unlikely M	Likely F	sig. test	Unlikely M	Likely F	Unlikely M	Likely F	sig. test
Say something to make them stop	20	7	80	94	ns	22	9	78	91	7.3**
Hope that they won't do it	33	19	66	81	5.0*	30	11	70	89	11.8**
Stop thinking about it	89	89	11	11	ns	87	87	13	13	ns
Tell them about the consequences	35	26	66	74	ns	39	26	61	75	ns
Not encourage them to do it	24	18	76	82	ns	18	19	82	81	ns
Remove friend from situation	-	-	-	-	ns	26	8	75	93	13.4**
Monitor their alcohol use (if a designated driver)	16	5	83	95	7.1**	-	-	-	-	-
Ignore them (don't give attention)	82	77	18	22	9.0**	-	-	-	-	-

Note. unlikely=score 1-5, likely= score 6-10, Missing data <5%, Significance testing with chi-squared tests, df =1, for all significant differences examination of the standardised residuals indicated the different cell to be males and unlikely.

Participants were also asked to indicate if they would intervene in particular situations, if their friends were driving too fast, their friend was drink driving and if they were driving in a generally unsafe manner. Few participants indicated that they didn't have any friends who would ever undertake the behaviours (4% have friends who would never speed, 19% never drink driver and 4% never drive in an unsafe way). Overall, many agreed that they would intervene and this was particularly the case for drink driving (see Table 7).

Table 7. Mean participants who agree that they would intervene

	Males		Females		Total	
	Mean	SD	Mean	SD	Mean	SD
Speeding	3.8	1.3	4.2	1.0	4.1	1.0
Drink driving	4.7	1.0	4.9	0.8	4.9	1.1
Driving unsafe*	3.8	1.2	4.3	0.8	4.1	0.9

Note. Missing data <5%, scored 1 (strongly disagree) - 7 (strongly agree), * $p < .05$, $t = -2.6$ (df 64.6, equal variance not assumed)

Discussion

Risky driving behaviours are related to the high rate of motor vehicle crash fatalities and injuries among young adults¹⁵. It is therefore important to develop approaches that might reduce such risky driving. A more novel approach to reduce harm may be to enlist the positive support of friends who are passengers. The current study aimed to explore intervening behaviour among friends and examine the potential for the internet as a suitable delivery method for messages that would promote intervening by passengers. Overall the findings show implementing a web-based program for the delivery of road safety messages of protecting friends tailored toward young adults has potential.

The findings showed that many young adults access information about road safety issues online and are accepting of the internet for use in obtaining transport information. Baronowski and Stables²³ suggest that the extent to which the program or messages are received by the target group (*reach*), the extent to which participants view or access material (*exposure*) and the extent to which participants conduct activities (*initial use*) are critical aspects in design. In this study, the young adults searched using *Google*, followed referrals from schools, university or other education institutes as well as referrals from family and friends thus highlighting a number of potential avenues of reach. In addition, some participants acknowledged specific transport topics that they have already searched; most frequently, licensing, and for males car maintenance and for females speeding and driver training. The sites already visited by young adults may represent an existing opportunity to promote road safety messages and create initial use points and exposure to road safety messages. This may be especially appropriate for young adults who are generally a harder to reach target for the delivery of road safety messages when messages are not promoted, encouraged or mandated.

The implementation and process for delivery of messages is important in any program design. While reach, exposure and initial use of material to the target audience are critical components of any intervention, *acceptance* or participant responsiveness from the target audience is also needed²³. The young adults reported that an interactive road safety program was a good idea for senior school students. In

addition, most strongly agreed that on reflection of their senior years they would use such a program for school work and many also agreed or strongly agreed that they would use such a program without prompting from school. While such findings must be considered in light of possible bias in reporting desirable responses and retrospective reports, surveys were anonymously completed online. Further, the findings do highlight some support which furthers implementation and acceptance; critical features for program delivery.

The study has encouraging findings regarding particular features deemed to be beneficial by Australian young adults. Many of the features are feasible and generally included in effective internet health promotion programs. Evaluation studies of web-based health promotion programs identify the provision of immediate, tailored feedback as a valuable component and importantly, the young adults acknowledged that this was indeed valuable. In many current approaches, tailored information is provided at a demographic level and in response to specific attitude and behavioural self-reports. For example, M-PASS²⁴ uses initial responses to normative perceptions and self-efficacy to provide information specific to those that may be in different quartiles of endorsement of the targeted attitudes and behaviours.

An important component of any school-based health promotion program is interactive delivery methods²⁰ and evaluations of web-based programs shows that interactive components are among those most frequently accessed²². According to Baranowski and Stables²³ perceptions of value increase the likelihood of *maintenance* or keeping participants involved and *exposure*, the extent to which target audiences are receptive and view materials. The current study found that quizzes and video were thought to be important for senior school students. An important design consideration for any young adult behaviour change program is delivering interactive and engaging material. The findings suggest that there are potential components that will be accepted by young adults. Interestingly, the findings showed greater support for all the targeted components when young adults were asked to consider a program for senior students compared with themselves. It is perhaps that the participants identified behaviour and attitude change components important for senior students and information provision for their own needs.

Urban, Amyx and Lorenzen²⁵ argue that issues of trust in a website are critical to likely use. The researchers noted that website trust stems from perceived integrity and confidence, competence and benevolence. The young adults who participated in the current study identified a number of sources that would relate to trustworthy sites. These included evidence to underscore claims, positive previous experience with the site and parental recommendations. Such sources are likely to overlap with perceptions of confidence and competence, for example, in having evidence and having previous positive experiences. It could also be suggested that having parental recommendations promotes perceptions of benevolence in having a site that is perhaps not for profit and considers the best interests of users.

Importantly for the development of messages of intervening behaviour, young adults indicated that they would intervene to protect their friends. This is consistent with a limited number of other studies in the area mostly conducted in North America²⁶. In particular, there is support for the potential for intervention in drink driving scenarios. The current study showed that Australia young adults were most likely to intervene if

their friends were drink driving. Highlighting the lesser acceptance of the behaviour. Also, consistent with the previous research in the area is that females were more likely to intervene in unsafe driving¹⁹.

Additional information was obtained regarding the kinds of responses that young adults may have to their friends' risky road behaviours (speeding, drink driving and generally unsafe behaviours). The young adults primarily endorsed active strategies and were less likely to endorse passive responses such as trying not to think about it. Active strategies in a drink driving context were found to be more effective than passive or indirect responses²⁷. The kinds of positive strategies reflected by participants might be promoted in a web-based program. Knowledge of the strategies used may assist program designers in tailoring programs that meet the differing needs of individuals.

While the findings provide some useful information that could be used in program design, a limitation of the current research is the homogenous nature of the sample. The survey primarily recruited young adults who were also students of one Queensland university and men were under represented.

In summary, it appears that the internet is potentially an important method of delivering large scale health communication messages. The findings suggest a number of components that might be critical in improving the reach, acceptance, and trustworthiness of messages delivered to young adults. In addition, there is potential for young passengers to play a direct role in improving the road safety of their friends and peers. A web-based approach to encouraging intervening behaviour may represent an additional strategy to improve road safety. A positive role of passengers in influencing driver behaviour may go some way to enhancing the safety of young people on the road and reducing the considerable toll that young adult injury has in the Australian community.

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