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In-vehicle filming of driver fatigue on YouTube: vlogs, crashes and bad advice

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Abstract

Background: Driver fatigue contributes to 15-30% of crashes, however it is difficult to objectively measure. Fatigue mitigation relies on driver self-moderation, placing great importance on the necessity for road safety campaigns to engage with their audience. Popular self-archiving website YouTube.com is a relatively unused source of public perceptions.

Method: A systematic YouTube.com search (videos uploaded 2/12/09 - 2/12/14) was conducted using driver fatigue related search terms. 442 relevant videos were identified. In-vehicle footage was separated for further analysis. Video reception was quantified in terms of number of views, likes, comments, dislikes and times duplicated. Qualitative analysis of comments was undertaken to identify key themes.

Results: 4.2% (n=107) of relevant uploaded videos contained in-vehicle footage. Three types of videos were identified: (1) dashcam footage (n=82); (2) speaking directly to the camera - vlogs (n=16); (3) passengers filming drivers (n=9). Two distinct types of comments emerged, those directly relating to driver fatigue and those more broadly about the video or its uploader. Driver fatigue comments included: attribution of behaviour cause, emotion experienced when watching the video and personal advice on staying awake while driving.

Discussion: In-vehicle footage related to driver fatigue is prevalent on YouTube.com and is actively engaged with by viewers. Comments were mixed in terms of criticism and sympathy for drivers. Willingness to share advice on staying awake suggests driver fatigue may be seen as a common yet controllable occurrence. This project provides new insight into driver fatigue perception, which may be considered by safety authorities when designing education campaigns.

Key words: social media, driver sleepiness, driver tiredness, driver drowsiness, driver behaviour, dashcam

Introduction

Fatigue has been promoted by the Queensland Police Service as one of the top 'fatal five' causes of crashes on Australian roads (Queensland Police, 2014). Fatigue is estimated to contribute to 15-30% of crashes (Connor et al., 2002; Williamson et al., 2011). Drivers who are fatigued have an increased risk of death or serious injury (Connor et al., 2002). While technology in the field of driver fatigue detection continues to improve, there is not currently any legally binding, standardised measure that could be used by drivers and police to measure fatigue (Radun & Radun, 2009). Instead, drivers need to self-monitor their fatigue levels and judge for themselves if they are fit to drive. It has been repeatedly observed that drivers are aware of feelings of fatigue e.g. (Filtness, Reyner, & Horne, 2012; Horne & Baulk, 2004; Williamson, Friswell, Olivier, & Grzebieta, 2014). Despite this, instances of self-reported

fatigued driving are common (Radun, Radun, Wahde, Watling, & Kecklund, 2015; Vanlaar, Simpson, Mayhew, & Robertson, 2008; Watling, Armstrong, Smith, & Wilson, in press). The issue then must turn to why drivers continue to drive once they experience feelings of fatigue? An understanding of how driver fatigue is perceived by the general public is necessary to develop effective strategies to mitigate fatigued driving behaviour (Fletcher, McCulloch, Baulk, & Dawson, 2005).

Social media provides a platform for large amounts of information to be shared widely. The free video sharing website YouTube.com is one of the most popular social media websites, with approximately 1 billion users (YouTube, 2015). In particular young adults are the most likely age group to participate in video sharing (Lenhart, Madden, Smith, & Macgill, 2009) and are over represented in driver fatigue crashes (Horne & Reyner, 1995). As online video viewership continues to grow (Bondad-Brown, Rice, & Pearce, 2012), and considering that online activities have been shown to influence youth behaviour (Lewis, Watson, White, & Tay, 2007) this may become an effective medium for information dissemination by safety education campaigns. However, this potential benefit could be tempered by the sharing of information contrary to safety messages, either as part of the video content itself or in comments contributed by users. An understanding of the current content available online can be used to gain an insight into what representations of driver fatigue already exist in the community. Specifically, videos filmed by users (as opposed to commercial entities) inside their vehicles present a direct experience of driver fatigue. The authors recent content analysis of driver fatigue videos on YouTube.com identified that driver fatigue is most frequently portrayed as dangerous, however, those videos which trivialised the issue received more views and evoked more comments (Hawkins & Filtness, 2015). Additionally, it was noted that the 3rd to 6th most viewed driver fatigue videos were in-vehicle footage.

Previous research investigating public opinion of driver fatigue has shown that fatigued drivers are perceived as less culpable than drunk drivers in fatal crashes. Overall, drivers report greater awareness and concern about drink driving than driver fatigue (Vanlaar et al., 2008; Williams, Davies, Thiele, Davidson, & MacLean, 2012). Drivers also self-report using ineffective countermeasures to driver fatigue such as going for a walk, opening a window and listening to music about as frequently as using the effective countersue of drinking coffee, and considerably more often than pulling over and taking a nap (Anund, Kecklund, Peters, & Åkerstedt, 2008). However, there is inevitably some bias in such self-report findings because participants are directed to consider driver fatigue, whereas, in real life a driver must recognise fatigue and implement countermeasures under their own initiative. Through using YouTube.com data the current work adds a novel perspective to the understanding of perceptions of driver fatigue in a naturalistic setting, external to the priming effect which may be experienced using self-report surveys that artificially draw attention to the issue of driver fatigue.

Content analysis of YouTube.com footage is becoming of increasing interest to the public health field (Sampson et al., 2013). The video sharing website provides a unique opportunity to view naturalistic public perception of a public health issue on a large scale, without the need for directing participants' attention towards the issue of interest. To date, investigations into YouTube.com footage have included a range of public health topics, including vaccination, electronic cigarettes and alcohol intoxication (Ache & Wallace, 2008; Luo, Zheng, Zeng, & Leischow, 2014; Primack, Colditz, Pang, & Jackson, 2015).

The current study seeks to further previous YouTube.com driver fatigue content analysis (Hawkins and Filtness, 2015) by focusing on the perception of in-vehicle footage. User generated comments have previously been used to analyse public opinions and perceptions of health and political issues (Jaspal, Nerlich, & Koteyko, 2013; Regan et al., 2014). Analysing comments on these videos can provide insight into how the videos are perceived by others. The aim of the current study was to understand more about public perception of in-vehicle footage of driver fatigue. The objectives to achieve this were (1) quantify the reception to different types of in-vehicle driver fatigue footage, (2) use a thematic approach to identify the types of response videos evoked from viewers.

Method

Data collection

A search spanning five years (2nd December 2009 - 2nd December 2014) was conducted using the inbuilt YouTube.com search feature. Search terms used were: “sleepy driving”, “driving sleepy”, “tired driver”, “drowsy driver”, “falling asleep while driving”, “driver fatigue”, “sleeping driver”, “tired driving”, “driving tired”, “fatigue driving”, “drowsy driving”, “driving drowsy” and “sleepy driver”. These videos were the same as those analysed in Hawkins and Filtness (2015). All videos were watched. Those that predominantly featured footage filmed from the inside of a vehicle were extracted for analysis. Videos that featured no in-vehicle footage, only a brief portion of in-vehicle footage or footage produced professionally for films or advertisements that were produced in a highly artificial and controlled environment were not considered in-vehicle filming.

Data analysis

Video content

Each relevant video was watched by one researcher and assigned to a predetermined group. Either vlog (video blog) whereby the driver spoke directly to the camera; dashcam footage of poor driving and crashes happening outside the vehicle; or passengers filming drivers.

Reception

Reception was quantified by recording frequencies for comments, likes, dislikes, total views and mean views per day. Reception was compared by video content group. Duplications of the same video were included in analysis to get a complete picture of the reception.

Comment themes

The comments associated with each identified video were extracted for qualitative analysis. Data analysis was conducted using Nvivo software (version 10, QSR). Analysis included all text that was part of a comment typed by a user or in one instance automatically generated when the user took action (shared on Google+). Comments that were an exact copy of a directly previous comment were excluded due to the assumption that these were uploaded in error. Other text such as user names were not included in coding. Comments written in a language other than English were excluded.

The identified comments were inductively coded by one researcher without determining categories in advance. In assigning codes each individual comment was considered within the context of surrounding comments and the video it was posted to. Thematic analysis was used

to classify comments into repeated concepts (Auerbach & Silverstein, 2003). Two researchers worked together to create broader categories by grouping common comment content themes.

Results and discussion

The initial YouTube.com search returned 559 videos. Videos were excluded if driver fatigue was not shown/discussed or was only briefly mentioned. In total 442 videos relevant to the topic of driver fatigue were considered. Of these, 107 (24%) predominantly featured in-vehicle footage, and were selected for further analysis. This sample consisted of 71 original videos and 36 duplicate videos.

Overall, dashcam footage was the most prevalent type of in-vehicle driver fatigue video. Table 1 shows the reception of videos by the type of in-vehicle footage. In terms of longevity, a video of dashcam footage has the most potential to create impact with the highest views per video per day. This is supported by the comparatively large numbers of likes, dislikes and comments they attract. These interactions suggest a high level of engagement with the viewer. It is concerning that 15% of these in-vehicle videos were drivers recording themselves speaking to camera while they were driving. Vlogging distracts the driver from their primary task which is particularly concerning when undertaken by a fatigued driver because tired drivers are more susceptible to distraction (Anderson & Horne, 2006). Mobile phone driver distraction research typically focuses on the driving implications of in-vehicle calls and texting e.g. (Gauld, Lewis, Haque, & Washington, 2015; Haque & Washington, 2013; Hosking, Young, & Regan, 2009), however, smart mobile phones have increased functionality including photo and video ability. Furthermore, a recent survey conducted by an Australian insurance provider reported that 14% of 18-24 year olds surveyed admitted taking a selfie while driving (AAMI, 2014). Future research should consider driver distraction implications of both vlogging and photo taking.

Table 1: Reception of in-vehicle videos

		Type of video		
		Dashcam n=82	vlog n=16	passenger filming n=9
	total	479887	293480	25751
	mean per video	5852.28	18342.50	2861.22
# views	range	2-194872	5-289297	4-14822
	mean per video	55.57	17.57	2.08
# views per day per video	range	0.01-4146.21	0.01-273.70	0.01-18.74
	total	3381	46	111
	mean per video	41.23	2.88	12.33
# likes	range	0-3088	0-18	0-99

	total	460	2	43
	mean per video	5.61	0.13	4.78
# dislikes	range	0-355	0-1	0-24
	total	1061	1267	77
	mean per video	12.94	79.19	8.56
#comments	range	0-659	0-1240	0-58

Comments

43 videos (40.2%) contained comments. Comments ranged widely in nature but two overarching themes were apparent. Distinction was made between (1) commenting directly on the issue of driver fatigue featured in the footage and (2) commenting on other aspects provoked from external factors such as video aesthetic quality.

On driver fatigue

Comments in this theme provide explicit insight into user's opinions of driver fatigue. These came in the form of situation specific and general judgements and opinions that are presented in Table 2. Four sub-categories of comment type were identified: relating directly to the events shown in the video, a response/experience of the viewer after having watched the video, speculation around future implications for the person(s) in the video and general discussion of driver fatigue.

Table 2 - Comments relating directly to fatigue in footage

Related to driver fatigue

Events shown

Attribution of behaviour cause

Sympathy for not at fault victim

Sympathetic of fatigued driver and/or acknowledgement of other causal factors

Critical of fatigued driver - they deserved to have a crash

Judgment (opinions) of the situation

Judgment of drivers

Recognition of bad situation

Sarcastic or joking

Attributing causes other than driver fatigue

Responses provoked by watching video

Emotion experienced when watching the video

Anger (unable to determine who directed to)

bad memories

concern

enjoyment of watching

fear
disappointed at negative outcome
shock

Sharing personal experiences

Future implications

Legal ramifications

Curious to know what happened after

General discussion about driver fatigue prompted by video content

Opinion of driver fatigue

Advice on staying awake while driving

Heated debate over who should be blamed for poor driving due to fatigue occurred in several situations. The most common defence of fatigued drivers was that other road users should have intervened to wake them up or were contributing to the crash by themselves driving poorly, e.g. a motorbike not being centred in the lane.

‘If you don't at least try to act up upon things that are harmful to humanity, you will get your punishment...sooner or later. Thats a law. You don't just watch and "slow down cause you dont want to be involved" thats the reason why people die: Cause othe people didnt want to get involved [sic]’

Other comments of support for the fatigued driver minimised their responsibility without placing blame but simply that it was a mistake or accident. More concerning were comments that did not believe dangerous behaviour could be caused by fatigue and some attributed the cause most often to alcohol, drug use or medical problems instead. These sympathetic views are not surprising when looking at fatigue as a common and natural force that is safe and perhaps enjoyable in other circumstances of life (Nelson, 1997). Drivers often report experiencing driver fatigue on self-report surveys (Radun et al., 2015) so it is possible these commenters have a personal fatigue experience, prompting them to defend the actions of the driver in the video.

Equally emotive though, were responses criticising the fatigued driver. ‘i [sic] would love to have some update on the white suv. i [sic] want him dead.’ Punishment for fatigued drivers ranged from pragmatic legal aspects such as covering legal costs to vigilante style retaliation such as breaking off the side mirrors of drivers who swerved out of lane.

These responses highlight a need for more education around the realities of driving tired and ways that individuals can take personal responsibility for their safety. In particular, attitudes of shifted or shared responsibility with other parties when crashes occur may present a reason why some people continue to drive while tired. In addition, the contradiction and debate between comments indicates that public perception of driver fatigue is mixed. These strong and divided emotive responses should be taken into consideration when developing mitigation strategies and in deciding whether graphic imagery should be used. This is important because evoking a strong emotional response can be undesirable for conveying safety messages (Tay & Watson, 2002). Within the comments, there is a perception that driving tired is a mistake, therefore, public education campaigns may wish to consider focusing on communicating that driving tired can be avoided with proper planning and

crashes can be prevented by pulling over to rest. Driver fatigue crashes are not unlucky mistakes.

Education may also be beneficial for correcting inaccurate beliefs about driver fatigue management. Safety messages are being accepted by some YouTube.com users. Accurate countermeasure suggestions included caffeinated food or beverages, pulling over, taking a nap and getting a lift with someone else instead. Such countermeasures have been demonstrated to be effective at reducing driver fatigue e.g. (Anund & Kecklund, 2011; Horne & Reyner, 1996). Other countermeasures were not as constructive. Loud music was often suggested as a means of staying awake. Music along with cold air have both been demonstrated as not effective at reducing driver fatigue (Anund et al., 2012; Reyner & Horne, 1998). Other suggestions were eating snacks, audio books, eating pepper or cinnamon, concentrating on getting home, cold air, chewing gum, singing, slapping yourself, being annoying to the driver (passengers) and sexual acts. These findings suggest fatigued drivers may continue to drive because they do not take driver fatigue seriously or see it as something that can be overcome by implementing countermeasures, naive to the reality that many may be ineffective. The presence of advice from unreliable sources in an online social setting has potential to normalise dangerous driving behaviour, especially as commenters spoke from firsthand experience. Further contributing to this normalisation may be vlog posts that explicitly state the driver is tired but do not enact any countermeasures or use the act of recording the vlog as a countermeasure itself. Vlogging is a fairly new concept and implications for driver distraction are not yet known.

On factors external to driver fatigue

Examining these comments gives insight into what external factors influence the way fatigue related in-vehicle footage is viewed, these concepts are presented in Table 3. Five sub-categories of comment type were identified.

Table 3: Factors external to driver fatigue

Not related to driver fatigue
Commenter centric
Off topic discussion
Promoting other videos
Opinions of other commenters
About the video itself
Should the footage exist?
Video editing/aesthetics
Shared on Google plus
Uploader promoting video
Inviting responses
Exclusive breaking news
Uploader directed comments
Speaking to uploader positively
Speaking to uploader negatively

All of the videos included in this analysis were about driver fatigue. However, not all viewer comments related to the video topic. The frequency of comments reflects engagement with

the video content. If video sharing is to be considered as a way to promote the dangers of driver fatigue it would be desirable to enhance viewer interaction as much as possible. The volume of comments not related to driver fatigue demonstrates that features of a video itself are just as important as the content topic for engaging with viewers.

Videos featuring music were often commented on, asking what the song was or praising song selection. The low quality of video resolution and shot framing were also common points discussed. Many comments questioned whether footage was staged or real. Labelling a video as 'fake' appeared to be a way of dismissing its relevance. These aspects may play a role in distracting from the serious nature of a video's events or messages, particularly for crash footage. Alternatively, making creative use of these elements may serve to catch the attention of viewers and then incorporate strategies to follow up with meaningful educational messages. Poor quality footage is often not a barrier to a video's success on YouTube.com; eye catching, easily searchable titles and relevance to current affairs are better facilitators of high viewership (Grajales III, Sheps, Ho, Novak-Lauscher, & Eysenbach, 2014).

Many videos with high numbers of comments featured ongoing interactions in the comments section. The uploader of the video often contributed to this by writing replies to comments and posting comments themselves to generate discussion e.g. 'Would you pull over if someone kept honking at you?' This use of the comments section as a place for ongoing discussion demonstrates a level of engagement beyond making a one off comment and moving onto a new video, rather commenters do indeed read other comments. Although many conversations went off topic, they usually had a starting point that was sparked from watching the video. This is encouraging as it shows potential capacity for a dialog on driver fatigue to be well received within the online community, with the aid of facilitation.

Conclusion and directions for future research

It is essential that drivers take action to mitigate their own fatigue because driving when fatigued results in three times greater chance of a crash or near-miss than driving when alert (Klauer, Dingus, Neale, Sudweeks, & Ramsey, 2006). Understanding the public perception of this issue can provide insight to help inform future road safety strategies.

Driver fatigue does have an online presence on YouTube.com. A large portion of these videos are of in-vehicle filming, most commonly dashcam footage of crashes. The general public are strongly divided in opinion when commenting on these videos. While there is an indication that watching these videos is a source of entertainment many comments are emotionally laden and debate driver fatigue related issues.

A strength of YouTube.com video comments is that users can comment using a pseudonym. This anonymity may result in honest responses. However, this also presents the limitation that users may choose to post comments to be provocative or to present a curated image of themselves online. In these instances the user's offline opinions of driver fatigue may differ.

It is acknowledged that the current findings are limited by the proportion of videos that viewers provided comments on. Difficulty in interpreting comments that were short, poorly spelt or lacking context may have led to conservative estimation, notably comments coded as 'anger (unable to determine who directed to)' may have been directed at the driver being filmed. Additionally, the popularity of the video uploader, in terms of number of subscribers

to a channel, was not considered as part of this study. Subscribers to an uploader's channel change over time as users subscribe and unsubscribe. It is not possible to obtain a record of the number of subscribers at the time of video upload. However, while subscribers may be more likely to view videos uploaded by a user they subscribe to, all videos analysed were public and could be viewed by any user regardless of whether they subscribed to the particular uploader or not. Future research may wish to consider uploaders' popularity (in terms of number of subscribers) and social influence. Understanding this influence could be useful as popular uploaders may be perceived as influential and may be capable of attracting higher video views. Future research could also investigate the link between dashcam, passenger filmed and vlog video opinions and actual driver behaviour. It is unknown if an entertaining and highly engaged with video can translate into better choices when drivers get behind the wheel.

This study contributes greater knowledge of not only what driver fatigue information and representations are generated and watched by the general public but also the existence of a dichotomy of opinion surrounding the issue. YouTube.com and other social networking platforms are a rich source of information which researchers can use to tangibly observe what captures the public's interest, as well as a potential source for information dissemination of safety strategies.

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