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Driver sleepiness on YouTube: A content analysis

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ABSTRACT

Driver sleepiness is a major contributor to severe crashes and fatalities on our roads. Many people continue to drive despite being aware of feeling tired. Prevention relies heavily on education campaigns as it is difficult to police driver sleepiness. The video sharing social media site YouTube is extremely popular, particularly with at risk driver demographics. Content and popularity of uploaded videos can provide insight into the quality of publicly accessible driver sleepiness information. The purpose of this research was to answer two questions; firstly, how prevalent are driver sleepiness videos on YouTube? And secondly, what are the general characteristics of driver sleepiness videos in terms of (a) outlook on driver sleepiness, (b) tone, (c) countermeasures to driver sleepiness, and, (d) driver demographics.

Using a keywords search, 442 relevant videos were found from a five year period (2nd December 2009–2nd December 2014). Tone, outlook, and countermeasure use were thematically coded. Driver demographic and video popularity data also were recorded. The majority of videos portrayed driver sleepiness as dangerous. However, videos that had an outlook towards driver sleepiness being amusing were viewed more often and had more mean per video comments and likes. Humorous videos regardless of outlook, were most popular. Most information regarding countermeasures to deal with driver sleepiness was accurate. Worryingly, 39.8% of videos with countermeasure information contained some kind of ineffective countermeasure. The use of humour to convey messages about the dangers of driver sleepiness may be a useful approach in educational interventions.

1. Introduction

Driver sleepiness (also referred to as driver-fatigue) related crashes account for 15–30% of vehicle crashes (Horne and Reyner, 1995b; Akerstedt, 2000; Connor et al., 2002; Williamson et al., 2011) and are associated with a higher risk of death and severe injury than other crashes (Horne and Reyner, 1995b). Young drivers are most at risk (Pack et al., 1995; Blazejewski et al., 2012). The true prevalence of such crashes is widely acknowledged to be underestimated (Horne and Reyner, 1995a; Liu et al., 2009). In part, underestimation occurs because sleepiness is difficult for the police to determine (Radun et al., 2013), but also because not all fatigue related crashes are reported to the police (Armstrong et al., 2013). Approximately 70% of drivers report driving when they are sleepy (Armstrong et al., 2013). Fatigued drivers are close to three times more likely to be involved in a crash or near-miss than non-fatigued drivers (Klauer et al., 2006). There is an imperative need to address this prevalent and dangerous driving state.

Mitigating sleep-related crashes remains a challenge for road safety authorities. Any legal requirement not to drive when fatigued is difficult to enforce, as police officers have no accurate objective measure of fatigue. Therefore, strategies to reduce driver fatigue are heavily reliant on driver education and public awareness campaigns (Fletcher et al., 2005). It has been reported that drivers are generally aware of tiredness signs and how to most effectively counteract sleepiness (Anund et al., 2008). Despite this, self-reported prevalence of driving when sleepy is high (Sagaspe et al., 2010; Armstrong et al., 2013). This disparity suggests that although education may be effective at imparting information, it is less effective at evoking response. It is unclear why this disparity exists, but it be may be considered to be risk-taking behaviour if the driver has an accurate knowledge of the risks when driving sleepy. Risk-taking behaviour itself is known to be influenced by sleep loss, for example under total sleep deprivation participants are more likely to engage in risk if potential gains are considered (McKenna et al., 2007). Similarly, adolescents who self-report low sleep quality are more likely to engage in risk-taking than individuals with good sleep quality (Telzer et al., 2013). One factor which increases prevalence of risk-taking and irresponsible behaviour is

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glorification of such behaviour by the media (Fischer et al., 2011, 2012).

The Internet has grown in dominance as a source of media exposure in the developed world. As such, social media is becoming an increasingly common method for information dissemination (Akagi, 2008). The free video sharing website YouTube is the third most visited website worldwide, with approximately 1 billion users (YouTube Statistics, 2015). Previous research of YouTube footage has documented that there is a vast amount of health information available (e.g. Keelan et al., 2007; Hussin et al., 2011; Lewis et al., 2011; Murugiah et al., 2011; Garg et al., 2015). However, there are limited investigations into road safety and driver behaviour footage (Steadman et al., 2014).

To our knowledge YouTube content has not been analysed in relation to driver sleepiness. YouTube was established in 2005, meaning those aged 16–17 who are currently obtaining learner driving permits, have grown up with access to this website. Most young adults in developed countries have regular internet access and they are likely to engage in video sharing more than any other age group (Lenhart, 2009). As young drivers are most at risk of driver fatigue crashes, and online activities influence youth behaviour (Lewis et al., 2011) this is a topic which merits exploration.

The current study presents a content analysis of driver sleepiness videos on YouTube. The content and popularity of these videos provide an insight into the quality of publicly accessible driver sleepiness information. This investigation is a first step towards understanding what content is available, how it is received and, potentially, considerations for the design of future education strategies. As such, the following research questions will be addressed:

RQ1: How prevalent are driver sleepiness videos on YouTube?
RQ2: What are the general characteristics of driver sleepiness videos in terms of (a) outlook on driver sleepiness, (b) tone, (c) countermeasures to driver sleepiness, and (d) driver demographics?

2. Method

2.1. Data collection

Using the inbuilt YouTube search function on 9th December 2014, a search of the last five years (2nd December 2009–2nd December 2014) was conducted using words related to driver sleepiness: "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". This approach was similar to that taken by Keelan et al. (2007) who conducted a YouTube content analysis of all videos identified using the inbuilt search function for "vaccination" and "immunization". A Google Trends analysis confirmed each term had been searched sufficient times (in relation to all Google searches) to register with Google Trends, with "sleeping driver", "driver fatigue" and "drowsy driving" as most searched for. A very popular search term "asleep at the wheel" was excluded because the majority of results were related to a music band of that name.

2.2. Data analysis

2.2.1. Video coding

The number of relevant videos identified allowed for all to be coded in a comprehensive analysis. This is in contrast to YouTube content analysis of other topics, where the coded sample is commonly limited to those with most views or on the first 10 pages (e.g. Garg et al., 2015; Hussin et al., 2011). Each video was watched and the content independently coded by two researchers. Content was deductively considered under three predefined themes: (1) tone of the video, (2) outlook on driver sleepiness, (3) portrayal of driver sleepiness (including countermeasures and driver demographics). In instances of disagreement the two coders re-watched the video together and discussed until consensus was reached. Discussion included the tone of 166 (37.6%) videos and the outlook on driver sleepiness of 118 (26.7%) videos. For videos where consensus could not be reached independent coding was undertaken by a third researcher. A final decision was made when two of the three researchers agreed. The third researcher considered the tone of 15 (3.4%) videos and outlook of 23 (5.2%) videos.

The tone of each video was coded as 'humorous', 'neutral' or 'serious'. Videos were considered to be humorous if the subject was acting in a light hearted way or making a joke. Neutral videos did not include any cues to indicate an attitude and were predominantly raw crash footage. Serious videos delivered information in a sombre manner.

Outlook on driver tiredness was coded as either 'dangerous', 'amusing', 'does not impact driving' or 'can be overcome'. Outlook was distinct from tone, as some videos used humour to relate a message that driver sleepiness is dangerous. Outlook was considered to be 'dangerous' if negative consequences of driver sleepiness were shown or mentioned. 'Amusing' videos had a mocking or joking aspect and negative consequences of driver sleepiness featured were made fun of. An outlook of 'does not impact driving' was assigned to videos that did not feature or express concern for impairment or other negative consequences associated with driver sleepiness. Videos classified as 'can be overcome' focused on countermeasures to overcome sleepiness and were particularly confident that they made driving safe. This approach of coding using predefined categories has previously been demonstrated as an effective approach to YouTube footage content analysis on the topic of immunisation (Keelan et al., 2007).

Several aspects contributed to portrayal of driver sleepiness. Countermeasures were categorised as effective or ineffective at mitigating driver sleepiness. Effective countermeasures included: take a nap, get adequate sleep the night before driving, caffeine, schedule regular stops, swap drivers, pull over if tired, limit driving at times when you are usually asleep, avoid alcohol, get a lift/don't drive if tired, seek medical advice for sleep disorders, commercial drivers follow the hours of service laws, avoid medications with drowsy side effects, don't start a long trip if you are already tired and educate young drivers (Anund and Kecklund, 2011; Anund et al., 2008; Fletcher et al., 2005). Ineffective countermeasures included: stretch/adjust posture, talk to passengers, cold air, listen to loud music/audio book, yell/sing, drink water, eat/chew gum, wet face, slap yourself, don't use cruise control, hold your mobile out of the window, have a red interior light, record a video blog and pre-drive meditation (Anund and Kecklund, 2011; Anund et al., 2008; Reyner and Horne, 1998). Videos which contained countermeasures were categorised by containing exclusively 'effective', exclusively 'ineffective' or 'mixed' information. Additionally, the gender of the driver portrayed as experiencing driver sleepiness and the type of vehicle being driven were noted for each unique video.

2.2.2. Reception

The reception of the video was recorded as number of views, mean daily views (total views/number of days online), number of likes, number of dislikes, and number of comments received. Reception metrics are reported as total, mean and range. This approach to quantifying reception including mean daily views is similar to that of other YouTube content analyses (e.g. Murugiah et al., 2011). The reception of the videos was compared by tone and outlook. The reception of videos including countermeasures was considered by tone. All duplications of the same video were considered together