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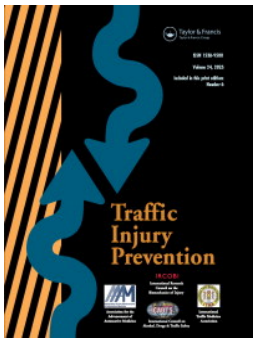
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Community narratives on Facebook regarding mobile phone use while driving and road policing technologies

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ABSTRACT

Objective: Mobile phone use while driving is a major cause of distraction and area for concern. Numerous factors have been shown to be associated with engagement in mobile phone use while driving, including peer influences and social media content encouraging the behavior. Phone detection cameras are being increasingly utilized to enforce the hand-held mobile phone use while driving ban in Australia, yet this has been accompanied by an emergence of camera location pages on social media platforms such as Facebook. Research is clearly needed to explore the nature and extent of this online content, since such information can be used to counteract any negative effects on enforcement.

Methods: Accordingly, this exploratory study analyzed content on Facebook pertaining to mobile phone use while driving, enforcement of the behavior and legal penalties associated with the behavior.

Results: A total of 167 public Facebook posts shared within Australia in January to October 2021 were examined. Overall, it was found that: (a) a large proportion (74%) of posts focused on the location of mobile phone cameras, (b) whilst most discussions centered around discouraging mobile phone use while driving, a large number also aimed to facilitate avoiding detection for the behavior. Finally, very few posts/comments acknowledged the risks associated with the behavior, including the risk of being caught.

Conclusions: This research provides preliminary evidence that social media platforms appear to provide an avenue to reduce the likelihood of apprehension. Avenues for future research are discussed.

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Introduction

Mobile phone use while driving is a major cause of distraction and a significant risk factor for fatalities and injuries (Oviedo-Trespalcacios et al. 2016). Irrespective of whether an individual is utilizing hand-held or hands-free operations, mobile phone use while driving adversely affects attention and driver behavior, such that the ability to respond to hazards on the road, and to maintain focus, following distances, speeds, and lane positions, are compromised (e.g., Caird et al. 2014; Oviedo-Trespalcacios et al. 2016). Despite these risks, it has been estimated that in countries such as Australia, approximately 50% of drivers use a hand-held mobile phone whilst operating a moving vehicle (Oviedo-Trespalcacios et al. 2017), with reasons for use including changing a song, messaging or snapchatting friends and checking social media platforms such as Facebook (George et al. 2018; Truelove et al. 2019). Using a hand-held mobile phone while driving is illegal across all states and territories in Australia, meaning that it is prohibited to have

a phone resting on any part of a driver's body (Australian Mobile Telecommunications Association 2023).

Several countermeasures have been implemented in Australia to combat mobile phone use while driving, including messaging campaigns (e.g., New South Wales Government 2022; Queensland Government 2023c) and increases to legal penalties, although these vary across states. For example, in regard to the latter, penalties have increased to AUD\$1078 and 4 demerit points in Queensland (Queensland Government 2023a). In addition, phone detection cameras have recently been implemented in some jurisdictions to deter drivers from using their phone (New South Wales Government 2023; Queensland Government 2023b), yet this has been accompanied by an emergence of police/camera location pages on social media platforms such as Facebook. Whilst there is evidence to suggest that such content can encourage drug driving (Mills et al. 2022; Mills et al. 2023), the nature and extent of this content pertaining to phone use while driving, and its subsequent impact on behavior and

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enforcement, remain unknown. Indeed, such knowledge is crucial for (a) optimizing enforcement of the mobile phone use while driving law and (b) informing the development of intervention strategies to deter the behavior. Therefore, as a starting point, this exploratory study analyzed content on Facebook pertaining to mobile phone use while driving, enforcement and legal penalties associated with the behavior. It should be noted that a qualitative approach to analyzing such data can provide valuable insights into how individuals perceive and respond to countermeasures/strategies aiming to reduce mobile phone use while driving. Such information can be used to inform targeted intervention strategies aiming to increase awareness of the risks associated with using a mobile phone while driving as well as to promote safe driving practices.

The impact of social media on behavior

Social media has become an integral part of modern life, enabling users to communicate with others, build interpersonal relationships and seek out information at the earliest convenience (Akram and Kumar 2017). To date, approximately 4.2 billion people are thought to use social media, 2.9 billion of which access Facebook (known as the most popular social networking site) on a monthly basis (Statista Research Department 2022). However, notwithstanding the popularity and benefits of social media, there is emerging evidence to suggest that online content might have negative impacts on society. In particular, recent evidence suggests that social media messages that promote risk-taking behaviors may increase one's likelihood of engaging in such behaviors (e.g., Boyle et al. 2016; Branley and Covey 2017), not least through the process of modeling. For example, studies have found that increasing exposure to online drinking, risk-taking, problematic eating, sexual activity, drug use, violence, self-harm/suicidality and mobile phone use while driving, all correlate with self-reported offline engagement in these behaviors (e.g., Arendt et al. 2019; Boyle et al. 2016; Branley and Covey 2017; Kingsbury et al. 2021; Stefanidis et al. 2022; Vannucci et al. 2020). Theories of human learning typically serve as the foundation for these studies, which emphasize the role of peer norms as a salient predictor of behavior, particularly in those who are younger in age or tend to engage in risk-taking behaviors on a typical basis (Ajzen 1991; Akers et al. 1995; Bandura 2001). Specifically, these theories posit that increasing exposure to content that is endorsed by one's peers can result in the behavior being perceived as "normal" or "socially acceptable", and ultimately increase one's risk of engaging in the behavior themselves. Importantly, this reasoning can also be applied to social media, whereby certain content may be promoted, encouraged or normalized through posts/comments, likes and shares from influential or significant others.

Social media and deterrence

In addition to promoting mobile phone use while driving behaviors, the existence and utilization of social media

technology to warn drivers of possible apprehension points (e.g., mobile phone cameras) may have a secondary diluting effect upon deterrent processes. For example, various pages and groups currently exist on the social media platform Facebook that post the locations of traffic enforcement cameras and police officers on the road (Wood and Thompson 2018). Preliminary research has identified that the way in which drivers use these sites can impact offending behavior, such as for drug driving (Mills et al. 2022). However, mobile phone detection cameras were very recently implemented in various Australian jurisdictions and are increasingly being utilized to apprehend and deter the motorist population from using their mobile phone while driving. As of 2021, these cameras were fully implemented in New South Wales and Queensland was conducting a trial of the cameras (where offenders were sent warnings instead of infringements). In October 2021, offenders caught by the cameras in Queensland were sent infringement notices. The cameras use artificial intelligence to detect illegal phone use and these images are then double checked by a person in government before an infringement is sent to a driver (Queensland Government 2023b).

Encouragingly, there is emerging evidence to indicate that drivers are using their phone less frequently following the implementation of the cameras in Queensland (Truelove et al. 2021a). These cameras aimed to enhance deterrence of the general public (general deterrence) by increasing drivers' awareness that they can be caught and punished for using their phone while driving. In addition, as the cameras aimed to apprehend and punish more offenders, they may also increase specific deterrence (i.e., deterring recidivist offenders from future offending). The recency of the implementation of the mobile phone detection cameras provides a unique opportunity to uncover the general public's perceptions toward these cameras on social media, as well as identifying how social media is used as a tool to promote the locations of these cameras. Furthermore, as enforcement of phone use while driving also occurs *via* police officers, identifying posts related to this enforcement method is also an important area to explore.

The current study

Given (a) the ever-increasing nature and saliency of social media, (b) its potential impact on behavior (e.g., Branley and Covey 2017; Stefanidis et al. 2022) and (c) the emergence of police and camera location pages, there is clearly a need to investigate the nature and extent of content that exists on social media surrounding mobile phone use while driving. Accordingly, this exploratory study analyzed content on Facebook pertaining to mobile phone use while driving, enforcement of the behavior (including phone detection cameras) and legal penalties associated with the behavior.

To accomplish this, a content analysis was conducted on publicly available Facebook posts within January to October 2021 across Australia. As stated above, this is particularly timely as mobile phone detection cameras have recently been implemented in various Australian jurisdictions, making this topic a pertinent area of discussion on social media platforms.

Method

The present study utilized a qualitative approach to explore public narratives of mobile phone use while driving, enforcement of the behavior and legal penalties associated with the behavior. Specifically, public Facebook posts pertaining to mobile phone use while driving and mobile phone detection cameras, shared across Australia in January-October 2021, were examined in this study. The analysis was limited to Australia and the year 2021 due to the recent implementation of detection cameras within New South Wales and trials in Queensland. No names, quotations or locations of posts were reported, to maintain the anonymity of posts/comments (as per ethics approval requirements). In addition, private posts were not examined in this study. Ethics approval was granted by the University of the Sunshine Coast Human Research Ethics Committee (S211553).

Search criteria and strategy

Data searches were conducted over a course of one month (October 2021), using the research unit's public Facebook page. A preliminary search was first conducted by a research assistant [MN], with the aim of identifying terms that captured the most relevant results. Search terms were subsequently reviewed and refined by the lead authors [KS and VT]. As a result, seven search terms were utilized in this study: mobile phone camera locations, mobile phone camera detection, police mobile phone camera, phone use while driving infringement, mobile phone detection, mobile phone use while driving and mobile phone locations. Further details concerning the procedures undertaken during this study (including details pertaining to data searches, coding, and data extraction) can be found in the protocol document (Appendix A).

Each search term was entered into the Facebook search bar. Using the filters provided, searches were restricted to public posts posted in January-October 2021, due to the recent implementation of mobile phone detection cameras in some jurisdictions. Public posts define those that are visible to any Facebook user and do not require permissions to view the comments or details within the post. All searches were conducted by MN or CS. Posts from outside of Australia, that were not in English or were not related to mobile phone cameras or phone use while driving, were excluded from analysis. These posts were marked as 'irrelevant' during the coding phase. This also included advertisements and content pertaining to speed cameras.

Data extraction

For each search term, the details of all available publicly shared posts were captured and saved for later analysis. These results were categorized and saved in excel spreadsheets according to post number and search term. In addition, it is of note that the Facebook algorithm utilizes user data to customize search results, in order to provide the most relevant information based on previous use, location and profile information. In light of this, the searches were

conducted using a single generic Facebook account that had minimal profile information, in an attempt to mitigate potential algorithmic bias. While this precaution was taken, there is still the potential for search results to have been influenced by the profile age, gender and location (Facebook 2022).

Coding

Types of posts and their respective levels of engagement/popularity

First, to provide necessary contextual information, a quantitative content analysis of the manifest content was used to understand the types of posts that were included in this study (Rourke and Anderson 2004). Posts were coded according to content type (e.g., infringement or phone detection cameras). Key Facebook metrics, which provide information regarding the popularity of the content, were also extracted. Specifically, the number of 'comments', 'likes', 'reactions' and 'shares' were noted (see Table 1 for definitions). Note however, that the types of reactions were not examined.

The nature of posts

Next, a qualitative content analysis was undertaken to analyze the data. This technique was chosen as it is a commonly used approach for social media analysis (e.g., Alanazi et al. 2022; Foley et al. 2015; Orth et al. 2020) and allowed the central concepts to be identified in the categories that were developed for coding (Franz et al. 2019). Considering the mixed nature of content on Facebook, both manifest and latent coding was utilized (Kleinheksel et al. 2020). As this was an exploratory study, the analysis was not guided by a theoretical framework. Further, coding schemes were developed inductively (Drisko and Maschi 2016). The lead authors [KS & VT], CS and MN first reviewed the data individually to become broadly familiar with the content. Following this, a consensus meeting was held to determine appropriate coding criteria. The same authors reviewed posts and agreed upon common categories that were identified from the data. Note that the key categories were determined on the basis of the research aims of the study. Specifically, any main topics or ideas pertaining to mobile phone use while driving, enforcement of the behavior (e.g., mobile phone detection cameras) and legal penalties associated with the behavior were used to inform the codes. As a result, a coding sheet was developed which outlined categories for each post and

Table 1. Definitions of Facebook metrics.

Facebook metrics	Definition
Comment	Allows you to comment on a post or video shared on Facebook
Likes	Allows you to indicate if you like a given post or comment
Reactions	Allows you to indicate your reaction to a given post or comment
Shares	Allows you to share a post, comment or video with others on Facebook

appropriate code labels. All posts were coded by MN or CS. The coders manually reviewed individual posts for each search team, using the coding spreadsheets. More specifically, the coder would review the content of each post and indicate which categories it fell under in the coding spreadsheet. Any cases of uncertainty were flagged and reviewed by the lead authors to ensure agreement was reached on the appropriate code. Further, a random sample of posts (10%) were also independently coded by the lead authors to ensure that the content was coded appropriately. Following further discussion (including resolving any disagreements or uncertainties), CS independently reviewed the complete dataset to ensure coding was refined and comprehensive. Note that inter-reliability statistics were not computed as any disagreements were addressed through discussion. As a result, the data was finalized by CS to ensure all codes adhered to the additional labels and effectively captured the meaning of the posts.

Thirteen categories were identified from the qualitative content analysis, including the following: form of legal enforcement is cameras, form of legal enforcement is police, informing of camera, discouraging (i.e., negative attitudes toward mobile phone use while driving), neutral (i.e., neither positive nor negative attitudes toward the behavior), informing of risks of phone use while driving, informing of risk of crash/injury specifically, informing of fine increase, informing of law, question about location of camera and other question related to mobile phone use while driving (note that descriptions of each category are located in [Table A2, Supplementary Material](#)). These covered the sentiment toward mobile phone use while driving, the form of legal sanction discussed/displayed, and type of information provided or requested. Note that these categories were not mutually exclusive, and as such a post could fall under multiple codes/categories.

Comment threads

As an exploratory qualitative content analysis, the overarching themes of the comment threads were also examined. To accomplish this, CS read through the comment threads to initially explore the data. A coding spreadsheet was then developed on the basis of the overarching ideas/topics within each thread that related to the research aims. Specifically, the main topic of discussion or idea pertaining to mobile phone use while driving, enforcement of the behavior and legal penalties associated with the behavior, within each thread were coded. Subsequently, similar codes/labels were grouped to identify overarching discussion points within the threads. Due to the length of the threads, it was not possible to code each comment. As such, the comments were grouped based on the topic discussed (e.g., if all comments in a thread pertained to confirming the location of a camera, this would be coded together. This often included many comment 'replies', which generally pertained to the same initial subject matter as the originating comment. CS was responsible for extracting the overarching themes of the thread, with KS and VT reviewing a random sample of the data (10%).

Quantitative data analysis

The data were imported into IBM SPSS Statistics (version 27) for analysis. Means, standard deviations and counts/percentages were reported for each type of post, and their respective number of comments, likes, reactions and shares. Note that statistical analyses could not be undertaken due to a lack of independent observations, in that some posts fell under multiple categories. Further, because we could not confirm whether the popularity metrics (e.g., likes or shares) were generated from different individuals (or alternatively, the same individual had liked multiple posts), we could not assume that the posts were independent.

Results

The data searches resulted in 538 publicly available posts posted within January-October 2021, across all search terms. Of these, 56 (10.41%) were identified as duplicates and excluded from analysis. In addition, 315 (58.55%) posts were deemed irrelevant (based on exclusion criteria) and were thus excluded. As such, the final sample comprised of 167 relevant Facebook posts (see [Table 2](#) for the number of posts captured by each search term).

Types of posts and their respective levels of engagement/popularity

A notable 123 (73.65%) posts mentioned the location of mobile phone detection cameras, 30 (17.96%) of which specifically mentioned the implementation of a new camera. The remaining posts concerned infringements ($n=28$, 16.77%) or fell under the category of other ($n=16$, 9.58%). Note that the latter ranged from questions concerning the mobile phone while driving laws/phone detection cameras, vandalism of cameras, or notifying users of the law or applications used to evade detection (e.g., Waze). The nature/type of these posts are broken down further below.

Visual inspection of the data revealed that the mean number of comments was higher for posts concerning infringements, followed by "other" topics and the location of cameras. Overall, posts concerning the location of cameras displayed the least mean number of comments, likes, reactions and shares (see [Table A1, Supplementary Material](#)).

The nature of posts

Notably, the majority of the posts provided information regarding mobile phone detection cameras. These most

Table 2. The total number of posts identified for each search term.

Search Term	<i>n</i>	%
Mobile phone camera detection	39	23.35%
Mobile phone camera locations	53	31.74%
Mobile phone detection	31	18.56%
Mobile phone locations	14	8.38%
Mobile phone use while driving	13	7.78%
Phone use while driving infringement	12	7.19%
Police mobile phone cameras	5	2.99%

commonly included warnings of camera implementation/deployment, or the exact location of a camera. While information about the cameras was a popular topic within the posts, only a minority referred to current legislation, as seen by the small percentage of posts informing of the law or questioning the law. Similarly, content referring to the risk of being caught by police or cameras was only noted in a small number of posts. Whilst there were posts that discouraged mobile phone use while driving, the majority of posts surrounded the notion of avoiding punishment for mobile phone use while driving (e.g., by informing others of the location of the mobile phone detection cameras). The list of coding variables and the number of posts falling within each category can be located in [Table A2, Supplementary Material](#).

General themes that were generated from comments threads

Careful inspection of the comment threads revealed that most discussions centered around discouraging mobile phone use while driving. These comments tended to focus on the risk that the behavior poses to other drivers, with a common sentiment that those who use their phone while driving are 'irresponsible'. Comments centered around discouraging phone use while driving also often called for greater police presence and higher penalties, with a tone of support for the new cameras in terms of enforcement. Conversely, requests for the location of phone detection cameras was also identified as a common theme. These discussions primarily aimed to determine the exact location of a mobile phone detection camera, with a clear motivation to avoid detection. These comments occasionally developed into contention among users, as those who discouraged phone use while driving tended to be at odds with those seeking out camera locations.

Revenue raising was also considered as a pertinent theme within the common threads, with many questioning the motive behind mobile phone detection cameras. Typically speaking, these discussions related to the impact on road safety, with users stating that the cameras would not decrease phone use while driving or related crashes. These comment threads ranged from a general mistrust of the camera technology to outright negative sentiments toward the cameras, police and government. In a few cases, this escalated to recommending vandalism of the cameras. These negative undertones also included a small number of discussions that encouraged others to use their phone while driving, with an attitude of 'just don't get caught'.

A few comment threads lead to discussion of preventative measures or avoidance technologies. This included recommending the use of a phone mount or applications like Waze, with the aim to avoid penalties. These suggestions were most often a result of commenters deeming the penalties too high, with some calling the current monetary fine for phone use 'ridiculous'. In contrast, calls to increase penalties for phone use were observed almost twice as often as those suggesting a decrease.

Discussion

This exploratory study analyzed content on Facebook pertaining to mobile phone use while driving, enforcement of the behavior (e.g., phone detection cameras) and legal penalties associated with the behavior. Out of the 167 relevant public Facebook posts identified from January-October 2021, the most common type of post (74%) concerned the location of a mobile phone detection camera. Whilst approximately 15% of posts discouraged mobile phone use while driving, very few posts acknowledged the risks associated with the behavior, including that of being caught. Finally, careful inspection of the comment threads indicated that whilst many people discouraged mobile phone use while driving (deeming the behavior as "irresponsible" and "risky"), a notable proportion of users encouraged the behavior, specifically by facilitating punishment avoidance. In such cases, the exact location of phone detection cameras were frequently reported. The fact that discussions surrounding strategies to engage in illicit activities were occurring so openly in the public should be a reason of concern for authorities. Previous research has demonstrated that Facebook content can be used to support engagement in risky driving behaviors such as drug driving (Mills et al. 2022), with the present findings suggesting that such content may facilitate punishment avoidance for mobile phone use while driving.

The possible negative effects of exposure to this type of content can be explained using the reconceptualised deterrence theory. Specifically, based on this theory, it has been shown that repeated exposure to offending behaviors without being caught can result in an increased likelihood of continued engagement in such behaviors, including mobile phone use while driving (e.g., Szogi et al. 2017; Truelove et al. 2019, 2021b). In addition, a recent study has revealed that a proportion of road drug users rely on police location pages on Facebook to avoid detection for impaired driving (Mills et al. 2022). With these findings in mind, almost 74% of posts examined in this study, notified users of the location of a phone detection camera, with very few posts acknowledging the risks of mobile phone use while driving. Specifically, only 15% of posts discouraged the behavior, and an underwhelming 4% of posts acknowledged the risk of getting caught for the offense. Taken together, it can be hypothesized that such content on Facebook is indeed promoting punishment avoidance for mobile phone use while driving, and potentially undermining perceptions of apprehension certainty. The low percentage of posts highlighting the negative consequences of phone use while driving is also a point of concern. These findings may suggest that drivers do not believe that legal sanctions are proportionate to the risks of the behavior. This lack of calibration between the risk and benefits of the intervention might reduce community acceptance of policies and jurisdictional initiatives. Nonetheless, further research is certainly needed to clarify whether exposure to enforcement activities online either (a) heightens perceptions of certainty (such that repeated exposure heightens awareness of roadside operations, thereby creating a general deterrent effect) or (b) undermines such perceptions, since they are aware of the location of these

operations and are exposed to others evading detection for the behavior.

The exploratory qualitative content analysis into the comment threads lends further support for the case that such pages are promoting punishment avoidance. Whilst several comments centered around discouraging the behavior (in that they deemed the behavior as “risky”, expressed support for the cameras and argued against those promoting the location of the cameras), avoiding punishment for the behavior remained a consistent theme. Interestingly, a number of users believed that the cameras would not be effective in reducing phone use while driving or related motor vehicle collisions. Such discussions resulted in users expressing a general mistrust of the camera technology, negative attitudes toward the police, cameras and government, as well as the use of modern technologies which enable users to avoid camera locations (e.g., Waze). It has recently been purported that such technologies not only result in driver distraction, but also represent a major setback for enforcement activities targeting mobile phone use while driving (Oviedo-Trespalacios and Watson 2021). Nonetheless, further research is needed to determine the impact of such technologies on road rule compliance. Whilst the present findings suggest that online content (and emerging avoidance technologies) may be promoting punishment avoidance (*via* direct or indirect pathways), research is clearly needed to investigate the extent of this issue. In particular, research is needed to determine whether such content simply promotes punishment avoidance or whether it actually creates a general deterrent effect through secondary exposure. Similarly, identifying the level of exposure required to influence perceptual deterrence and behavior should be a priority for future research. Policy makers could use such information to optimize the effectiveness of existing countermeasures. For example, messaging campaigns could be shared more frequently on social media platforms to increase exposure. In addition, messages could notify users that cameras are operating in certain areas (without specific locations) to increase general deterrence.

Limitations

There are limitations to consider when interpreting the present findings. First, the analysis was limited to content shared within Australia, which may limit the generalizability of the findings (particularly since a large proportion of posts concerned mobile phone detection cameras and legal enforcement of the behavior). On a similar note, the present analysis was derived from public Facebook posts. Based on the limited number of posts identified in this analysis, it could be the case that phone use while driving and phone detection cameras may not necessarily be topics of interest on social media. However, it is apparent that a number of private location pages and groups exist on Facebook, particularly in relation to mobile phone detection cameras. As such, it could be the case that the present findings are an underestimation of the true proportion of posts containing the location of phone detection cameras. However, the fact that approximately 74% of posts notified other users of the location of the camera, highlights that this is an area for concern,

and warrants further investigation. Finally, whilst this study offers insight into the nature of online content pertaining to mobile phone use while driving, further research is needed to determine its impact on subsequent engagement in the behavior. In addition, research would benefit from exploring the impact of other popular social media platforms, such as TikTok.

Concluding remarks

Nonetheless, this exploratory study represents the first attempt to investigate the nature of content on Facebook pertaining to mobile phone use while driving, legal enforcement of the behavior (e.g., cameras) and legal sanctions. Such analyses can provide valuable insights into how individuals perceive and respond to strategies designed to discourage phone use while driving. By examining social media posts, we can gain a deeper understanding of individuals’ opinions and beliefs, as well as the type of information they consume and disseminate about this behavior. Further, such analyses can help identify potential barriers to policy enforcement and help formulate strategies to minimize resistance. In addition, social media platforms offer a space for individuals to share personal experiences and anecdotes concerning mobile phone use while driving, which enhances our understanding of different behavioral patterns. These insights can be used to create targeted intervention strategies aiming to increase awareness of the risks associated with phone use while driving as well as promote safe driving behaviors. Ultimately, by analyzing social media content, we can gain a more nuanced understanding of public attitudes and behaviors toward phone use while driving, enabling the creation of more effective intervention strategies to reduce the number of crashes caused by distracted driving.

Considering the above, the findings from this study indicate that Facebook communities infrequently address the risks associated with phone use while driving. Instead, they often disseminate strategies to avoid law enforcement, which could ultimately lead to individuals evading punishment for engaging in the behavior. Importantly, the findings highlight the need for future research to determine whether such content merely encourages evasion of punishment or whether it creates a general deterrent effect through secondary exposure. Future research should also consider how social media may be used to further support intervention measures, such as by building trust in phone detection cameras, increasing exposure to messages that promote and endorse rule compliance (e.g., *via* online influencers or role models) and emphasizing the risks of engaging in the offending behavior.

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