Blame of Crash Causation Across Varying Levels of Vehicle Automation

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Abstract

The question over "who is responsible" for a crash involving automation has been debated however it is important to ascertain public perceptions in order to guide the development of legal frameworks for managing crashes at varying levels of automation. Undergraduate students responded to a series of vignettes with the automation level manipulated, answering questions about blame. Participants assigned blame to six possible stakeholders (driver, pedestrian, car, government, manufacturer, programmer), with 37.4% blaming the driver in the fully automated scenario. Participants called for either an improvement in or avoidance of automation. These findings have implications for the development of legal frameworks and for trust in autonomous vehicles.

Background: Public opinion towards automated vehicles (AVs) is largely favourable (Kyriakidis, Happee & deWinter, 2015). Despite this, there are a number of recurrent concerns around AVs, including legal responsibility in the event of a crash (Schoettle & Sivak, 2014). Theoretical papers have debated the complexities surrounding the legal responsibility of crashes involving AVs, with opinions ranging from the driver is always accountable to the impossibility of holding machines responsible (Gless, Silverman, & Weigend, 2016). Whilst "who is responsible" for a crash involving different levels of automation has been debated, little is known about public opinion on blame in automated crashes. It is important to understand public perceptions of responsibility for accidents involving different levels of automation, and the perceived consequences of that responsibility, in order for policy makers to develop frameworks legal frameworks.

Method: Participants in this study were 129 undergraduate psychology students from the Australian Catholic University. Ages ranged from 19 – 61 (M=24.6, SD=7.64), 78% female, with less than 5 years driving experience. Four vignettes presented a crash scenario with the automation level manipulated (manual driving, partially automated, highly automated and fully automated driving). An example vignette is: *'A 35 year old male is crossing a suburban street during the day at the zebra crossing. At the same time, a manually driven car is going down the same straight street. The driver is on their phone. The pedestrian is hit.'* Participants were asked three open-ended questions; 'Where do you assign blame?', 'Based on where you assign blame, what course of action would you take from here?', and 'How could this event be prevented in the future?'.

Results: Participants attributed blame to six broad stakeholder categories (driver, pedestrian, car, government, manufacturer and programmer). As automation increased, the proportion of respondents who blamed the driver decreased, whilst those blaming the manufacturer increased (see Figure 1). 37.4% continued to blame the driver in the fully automated scenario. Participants commonly identified legal action against the driver, the manufacturer or both as their course of action. The proportions varied across automation, with legal action against the driver still named by 11.9% when fully automated. Possible prevention strategies included ensuring the driver is more attentive (manual 40.3%, partial 50.8%, highly 37.2%, fully 14%). As level of automation increased, there were increased calls for automation to be improved (9.3%, 12.5%, 24.8%, 34.9%), or avoided (1.6%, 10.2%, 17.8%, 24.9%).

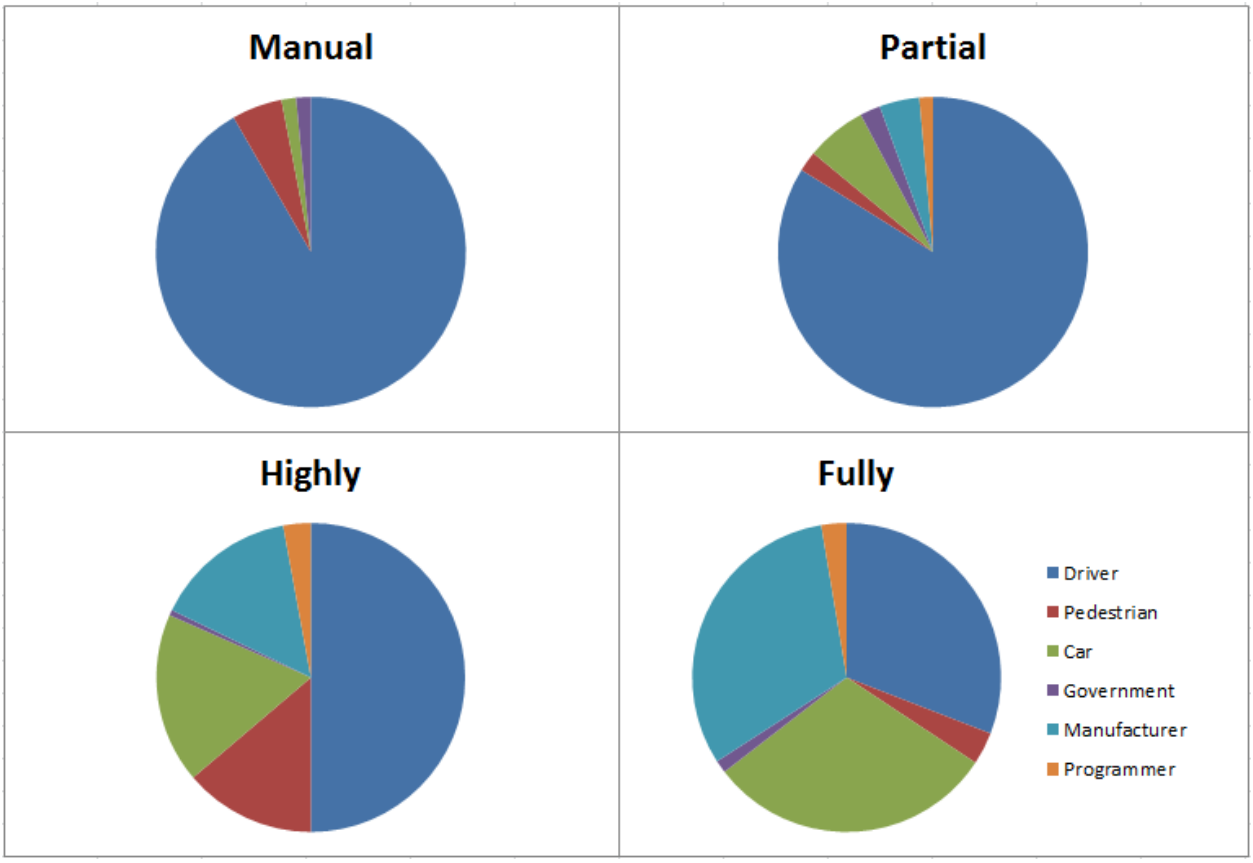

Figure 1. Proportion of blame assigned to key stakeholders by level of automation.

Discussion: The present study established that there is no consensus regarding responsibility for crashes for varying levels of automation. Areas of discrepancy were highlighted during cases of highly or fully automated, suggesting that this is a legal grey area. Of note, the driver is deemed responsible, with legal consequences, for a crash in fully automated scenarios when there is no steering wheel. This study suggests that there may be a greater need to protect drivers from liability in crashes involving higher levels of automation. Given that in cases of high levels of automation, participants called for either an improvement in AVs or they would avoid AVs, these findings will have implications for manufacturers on how to manage the fallout from crashes.

References

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