A Call to Improve Sampling Methodology and Reporting in Young Novice Driver Research

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Title
A call to improve sampling methodology and reporting in young novice driver research

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Abstract

Young drivers continue to be overrepresented in road crash fatalities despite a multitude of research, communication and intervention. Evidence-based improvement depends to a great extent upon research methodology quality and its reporting, with known limitations in the peer-review process. The aim of the current research was to review the scope of research methodologies applied in ‘young driver’ and ‘teen driver’ research and their reporting in four peer-review journals in the field between January 2006 and December 2013. In total 806 articles were identified and assessed. Reporting omissions included participant gender (11% of papers), response rates (49%), retention rates (39%), and information regarding incentives (44%). Greater breadth and specific improvements in study designs and reporting are thereby identified as a means to further advance the field.
A Call to Improve Sampling Methodology and Reporting in Young Novice Driver Research

Young novice driver crashes have posed a major challenge for road safety researchers, practitioners, and policy-makers for decades, with young and inexperienced drivers persistently overrepresented in road crashes globally [1-3]. A breadth of research has focused upon identifying and ameliorating young driver risks, and interventions necessarily emerge from and are informed by this extant literature. Therefore, the effectiveness of interventions largely depends upon research methodology quality and its comprehensive reporting. There are, however, known limitations to the peer-review process, recently discussed in terms of biased reviews and conflicting reviewer reports [4,5]. However, human limitations also apply, such that authors, reviewers and editors alike can simply fail to attend to reporting of certain details, such as nuances and assumptions of certain methodologies or analyses while focusing on “bigger picture” details of the methods and the manuscript as a whole.

The importance of sampling methodology in particular has been highlighted within the road safety field, including motorcycle epidemiology [6] and psychiatric morbidity post-crash involvement [7]. More recently as an exploratory exercise, we assessed the methodologies of 30 young driver studies in a single journal during a five-year period 2008-2012 [8]. We found “young” drivers were reportedly aged between 15 to 35 years and “novice” drivers included those up to age 65. This complicated our ability to interpret the key implications for interventions to target the youngest beginning drivers; that is, those with the highest crash risk. Moreover, we found that, of 22 articles for which reporting an initial response rate was appropriate, 12 (55%) failed to do so, or to discuss sampling limitations and their implications. We therefore extended this exploration to three additional journals which are known to regularly publish young driver research, and expanded the time frame examined to eight years, allowing us to determine potential gaps and therefore avenues for improving the effectiveness of young driver road safety interventions.
Young novice sampling and reporting in four journals 2006-2013

We identified 806 original research articles that included the search terms ‘young driver’ or ‘teen driver’ in (alphabetically) Accident Research and Prevention (480 papers or 56.9%), Journal of Safety Research (110, 13.6%), Traffic Injury Prevention (54, 6.7%), and Transportation Research Part F: Traffic Psychology and Behaviour (162, 20.1%) published between 1 January 2006 and 31 December 2013 using ScienceDirect and Taylor & Francis online search facilities. Details on sampling (including participants’ age, gender) and study design (response rate, retention rate, incentives) were examined for each of these 806 articles, and results collated by a single assessor.

Participant information

We applied a broad age range to define “young” drivers: 16-25 years. This accounted for a typical minimum age in countries with low minimum ages (such as New Zealand and the United States) through to the age after which crash reductions are apparent and restrictions no longer apply in countries with high minimum ages (such as Australia) [9,10]. Age range was provided in 593 (73.6%) papers (ranging across the four journals from 59.1% to 81.5%); of which 130 (21.9%) included young driver ages only (range 16.2% to 56.8%). Five papers (0.8%) included pre-licence (before legal learner permit/licence) ages in the jurisdiction of the research (i.e. typically <16 years) (range 0.8% to 1.5%); and 77.2% combined pre-licence, young and/or older drivers (range 43.2% to 83.1%). Central tendency (mean) age was provided in only 12.7% papers (range 3.7% to 14.8%), with the remaining 13.8% non-specific with respect to age (e.g., “<19”, “high school students”). In total, 720 (89.3%) reported on participants’ gender (range 80.9% to 96.3%). That is, for 10.7% of papers, there was no mention if the study included only males, females or both genders.

Study design
While response rates were not relevant for 27.4% of papers (e.g. observational studies), they were only reported in 51.2% of relevant papers (range 33.3% to 74.1%). Participant retention rate was irrelevant for 717 papers (89.0%). Of the remaining 89 papers, 64.0% specified retention rates (range 50.0% to 100%). Information regarding reimbursements or participant incentives was provided in 35.2% of papers in which information regarding incentives was applicable (range 25.4% to 45.1%).

**Implications for future young novice driver research and interventions**

This assessment revealed several important limitations in young novice driver sampling and gaps in methodology reporting. Age was inconsistently reported in terms of both age range and central age tendency without supporting information to determine likely novice versus experienced driver status in order to compare findings across studies and assess likely relevance for a given jurisdiction. More than one-quarter of the studies did not include the age range. Some “young driver” studies included ages below the legal driving age and others were combined with older-aged experienced drivers. Even for gender, more than one-tenth of all articles did not specify whether a single or mixed gender sample was included, let alone the relative proportion of males and females. Response rates were not reported in over half of appropriate studies nor retention rates in over one-third, and 351 papers (43.5%) were lacking information regarding participant reimbursements or incentives. In addition, it is noteworthy that some response rates were low (e.g. the response rate of 23.8% of papers published in Traffic Injury Prevention were ≤25%), it is noteworthy that such low rates do not necessarily preclude generalisability and validity of the findings; rather it is fundamental that the response rates are reported and their implications discussed at the time of dissemination.

Limitations of this work include restriction to four journals only and use of a single assessor, which could have led to some misclassifications. This analysis is presented as illustrative only rather than as comprehensive. However, the journals are of high reputation in
the road safety field and there was not one particular journal that “performed worse” across all the variables, but rather inconsistent reporting was found across all four. Therefore the results do suggest a lack of attention-to-detail in sampling and methodological reporting, as well as peer reviewing.

Overall, this assessment suggests there are inherent limitations in the comparability and generalisability of the current young novice driver research evidence base. Improved attention to selecting, defining and reporting target populations in ways that clearly delineate both young and novice status, and reporting sampling methodologies and their limitations, is greatly needed to advance the field. This serves as a reminder and call out to authors, reviewers and editors of the importance of attention-to-detail in the peer-review process to ensure all relevant methodological details (particularly gender, age, incentives, response and retention rates), as well as methodological limitations are reported to enhance the comparability and generalisability of the results and to advance the young novice driver research field.

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References


What is already known on this subject

167  • Young drivers remain overrepresented in road crashes
168  • The young driver problem has generated a plethora of research which can inform effective intervention

What this study adds

173  • Limitations in young novice driver sampling and gaps in methodology reporting can impede appraisal of the validity and the generalisability of the findings
174  • Attention to reporting all study-relevant data, especially age and licence status if possible, is important when used to guide effective development, implementation, and evaluation of young driver-specific interventions