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## What Features Do Young Novice Drivers Want in Their Car?

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**Abstract:** Young novice driver road safety remains an intractable problem; independently-licensed young drivers with access to their own vehicle at greatest risk on the road. Moreover, vehicle safety is a critical factor in the survivability of road crashes for all road users, including the vehicle occupants and vulnerable road users such as cyclists and pedestrians. To better understand vehicle choice, and therefore to gain insight into where young novice drivers weigh vehicle safety amid other considerations, teens from two Australian states were given the opportunity to design their ‘perfect car’. The findings have intervention implications for young novice driver injury prevention and safety promotion specifically, and for drivers of all ages and driving experience more generally. Teens rated features other than safety very highly in their ‘perfect car’, and it is likely these non-safety-focused features similarly rate highly in vehicle purchase decisions. Parents and teens alike need to be educated regarding risks associated with non-safety-focused features—and benefits associated with safety features—with consideration of insurance or other incentives for purchasing and driving safer vehicles. Such incentives and education should target drivers (and passengers) of all ages more generally. In addition, the methodology is also an innovative means by which to engage with intervention targets, revealing potential messaging avenues for a particularly vulnerable population. DOI: 10.13813/j.cn11-5141/u.2018.0309-en

**Keywords:** young novice driver; teen driver; vehicle; safety; intervention; vehicle purchase decisions

### 1 Introduction

The proportion of casualties in road traffic accidents caused by young novice drivers<sup>(1)</sup> (namely young drivers) remains high, therefore, the world is worried about the safety. For example, from 2001 to 2010, the casualty rate of 18-year-old drivers in Australia and New Zealand was the highest among all road traffic accidents<sup>[1]</sup>. In Queensland, Australia, although these young drivers account for only 6.1% of the total number of people with driver’s license<sup>[2]</sup>, 17.6% of road traffic accidents resulting in the hospitalization of one or more injured persons are caused by drivers aged 17 to 20<sup>[3]</sup>.

Research consistently demonstrates that most young novice drivers (herein referred to young drivers) have access to their own vehicle or can drive vehicle alone. They have admitted that they can engage in risky driving behaviours, such as dangerous driving behaviours, crashes, and offences<sup>[4–9]</sup>. Young drivers are also likely to drive smaller, older cars which offer less crash-avoidance mechanisms (e.g., electronic stability control) and crash-protective

measures (e.g., airbags)<sup>[10–13]</sup>. A five-year increase in the model year of the car driven by the young driver, the odds fatally injured will increase by 5%<sup>[14]</sup>.

Parents are pivotal in teen car ownership<sup>[15–16]</sup>. Pleasingly, when parents are asked about the type of car they were purchasing for their child, safety concerns for their teen driver features prominently in their decision-making, and they are aware what constitutes the desirable safety features of a car. Despite this, parents intended to buy a smaller, cheaper car for the young driver that was unlikely to have these safety features<sup>[17]</sup>. In addition, young drivers are influential in the purchase of the vehicle, often stating their preferred vehicle based on features other than safety<sup>[16]</sup>. Teen males in the United States reported the five key features that they wanted in their vehicle as (1) performance, (2) looks, (3) sound system, (4) modifiable, (5) coupe<sup>[18]</sup>. These findings are consistent with Australian-based research in which young drivers rated the colour of the vehicle and the stereo, as key features<sup>[16]</sup>. The general driving risk of the British young drivers with high performance cars increase, especially at night<sup>[19]</sup>. And the choice of car by females, such as 4WDs (four-wheel drive cars), have greater

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risks (the casualty rate for males driving 4WDs is 13% greater than driving common vehicles, while 28% greater for females) <sup>[20]</sup>. An analysis of crashes in Victoria, Australia, revealed that if young drivers were driving a vehicle with the best crash-avoidance level, rather than their own car which was likely to be older and smaller, road crash fatalities and injuries could be reduced by 89% <sup>[21]</sup>.

While much insight into the car purchasing behaviour and the safety of vehicles has emerged from the traditional “WEIRD” countries (Western, Educated, Industrialized, Rich and Democratic <sup>[22-23]</sup>), countries with rapid mobility, such as Colombia and China, are also interested in driving safety. Vehicle safety should be widespread concerned, particularly when survey based studies in developing nations such as Colombia revealed that half of the cars driven by young drivers received a safety rating of 0–2 when scaled against a 0–5-star rating system (more stars reflect greater vehicle safety <sup>[24]</sup>). Similarly, observation studies in China revealed that vehicle passengers do not always wear their seatbelt <sup>[25]</sup>. In terms of protection mechanism of vehicles, seatbelt is the first line of defence in the case of a road crash. While regulation of the rate of vehicle ownership and vehicle use in regions of China, such as Shanghai, has been implemented (e.g., limitations on the number of new private vehicle license plates issued by authorities <sup>[26]</sup>), education of novice drivers still remains challenging <sup>[27]</sup>.

A number of safety educations on young driver have been implemented around the world. These efforts include emphasizing the need for young and inexperienced drivers to be in the safest car, in addition to explaining various resources of vehicle safety features, such as Antilock Brake System (ABS) <sup>[28-30]</sup>. However, recent research in Queensland suggests that these resources are limited, therefore, it is unclear whether parents or the young drivers can get these resources <sup>[16]</sup>.

## 2 Method

In a large one-day campus activity, Grade 11 students from 11 high schools in Queensland (QLD) and New South Wales (NSW) participated in a 6-part road safety-focused program for a small fee (RMB99/student). Every student participated in one activity in which groups of two to six teens were provided three to five minutes to draw their “perfect car” using permanent markers on an A1 poster. The instructions provided to students at the start of the vehicle-related education session were to work in (self-selected) groups of up to six teens, in a free-form drawing activity in which they were told to “design the perfect car for you, your mates and your family to travel in” using the template provided. The author observed one school’s students’ participation in the activity (approximately 200 students, divided in 53 groups), and noted that the students engaged in frenzied

drawing of features for the first one to two minutes, as each teen ensured their perfect feature was documented by one or more “artists” within the group. In addition, it was observed that moderators concluded the drawing session when it became apparent that teens appeared to have completed their drawing, such as by commenting on each other’s features, or by placing their pen on the table. At the end of the poster drawing session, groups were asked to nominate two members to share the “perfect car” poster with the remainder of the groups. During this informal one to two minute presentation, the moderator discussed why various features were included, and commented on similarities and (or) differences between features drawn by each group in relation to the other groups.

It is notable that the small group activity with a time limit of 5 minutes is likely to result in the most salient vehicle features being drawn on the large poster. Therefore, the aim of the present research was to analyse the features noted in the “perfect cars” to reveal the nature of the vehicle features considered important by teen drivers. In addition, posters were completed in two different Australian judicial districts (Queensland and New South Wales) with different graduated driver licensing programs <sup>(2)</sup>, therefore the results of this innovative research methodology can be guaranteed to be stable. Approximately 900 students aged 15–17 years from Grade 11 (in Australia, students typically turn 16 years of age during Grade 11, and 17 years of age during Grade 12, therefore it is anticipated that the majority of students were aged 16 years) completed the drawing activity, with session moderators mingling amongst the tables which held the posters to encourage every teen in every group to contribute to the drawing of the “perfect car”. As such students were either pre-license, held a learner driver’s license, or held a provisional driver’s license. The car template on poster is depicted in Fig. 1, with students drawing features on and around the vehicle (as seen in Fig. 2), including naming the features and, in some instances, footnotes were added to explain the feature(s) in more detail. The contents of 152 posters (QLD,  $n = 30$ ; NSW,  $n = 122$ ) were examined. Exploratory analyses (independent samples t-test) were conducted to investigate the relationships between the students’ state and the number of standard, safety, luxury, bizarre and other features included in their posters.

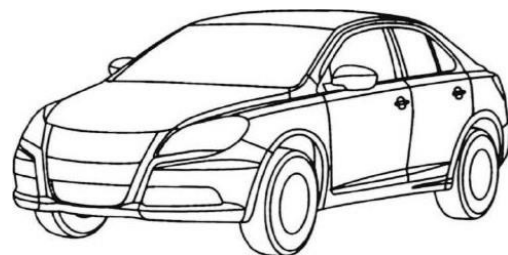
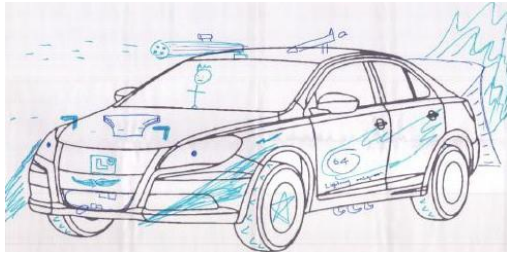


Fig. 1 The ‘perfect car’ template



**Fig. 2** A 'perfect car' example with painted features

The features were categorised according to standard vehicle features (i.e., features expected in all vehicles), safety vehicle features (features specifically designed to prevent, or protect in the event of, a car crash), luxury vehicle features (features designed to increase the visual and other appeal, such as driver comfort, of the vehicle), bizarre vehicle features (features that are strange and (or) unusual vehicle features), and other vehicle features (features which may be

in a vehicle, but do not necessarily fall within the scope of the other categories).

### 3 Results

The posters included between 0 (n = 3) and 17 features (n = 1), with an average of seven features per poster (n = 23) (QLD range 0–11, M = 6, mode = 5, n = 12; NSW range 0–17, M = 7, mode = 4 and 7, n = 15). The posters detailed 328 different features (QLD n = 86; NSW n = 294), which were included between 1 (n = 257) and 46 (n = 1) times (M = 3, mode = 1) (QLD range 1–13, M = 2, mode = 1, n = 61; NSW range = 1–46, M = 3, mode = 1, n = 196). All the features were summarized in Tab. 1 by different categories.

**Tab. 1** Vehicle features drawn by young novice drivers

standard features	safety features	luxury features	bizarre features
headlight(48)	airbags(48)	rims(56)	guns, weapon(22)
(front and rear) seat(38)	reversing camera(19)	paint(49)	passenger(12)
steering wheel(33)	child lock(7)	decorative car body attachment(48)	stiker(10)
seatbelt(33)	traction control(5)	decorative light(36)	smoke(8)
exhaust pipe(33)	power steering(2)	ornaments, sticker(36)	wing(8)
tyre(32)	automatic brake(2)	convertible, sun roof(33)	animal(8)
number plate(25)	parking sensor(2)	air intake, hood scoop, supercharger(33)	sprinkler(6)
rear-view mirror(22)	five-star ANCAP <sup>1</sup> (2)	stereo, speaker(25)	items on roof(5)
front grill(9)	blind spot camera(1)	tinted window(25)	mini bar, fridge(4)
windscreen wipe(9)	automatic headlight(1)	turbo engine, V12 engine(13)	television, antenna, pay television <sup>2</sup> (3)
brake light(7)	baby seat anchor(1)	magal rim(9)	diamond-impregnated wheel(2)
side-view mirror(5)		manual sensor(8)	TNT on bottom of vehicle(2)
dashboard(5)		leather seat(8)	food(2)
engine(5)		seat warmer(7)	sleigh(2)
mirror(5)		air conditioner(5)	thermometer(2)
door(4)		lowered chassis(5)	toilet(2)
suspension(3)		nitrogen and oxygen accelerator engine(4)	helicopter blade(2)
radio(3)		sunshade(3)	padlock(2)
windshield(2)		cruise control(3)	gravity(1)
bonnet(2)		dynamic braking tyre(3)	robot(1)
brakes(2)		television(3)	self-destruct button(1)
hazard light(2)		5-inch/oversized exhaust hole(3)	selfie booth(1)
window(2)		cup holder/warmer(2)	pool under bonnet(1)
roof(2)		carbon hood(2)	stairs(1)
screw jack(1)		automatic window(2)	coffee maker(1)
fog light(1)		bullbar(1)	shop(1)
diesel engine(1)		black carpet interior(1)	water fountain(1)
head rest(1)		foghorn(1)	hair straightener(1)
front bumper(1)		automatic roof(1)	beauty salon(1)
muffler(1)		batwing door(1)	plate(1)
manual transmission(1)			hover mode(1)
petrol hole(1)			vertical take-off booster(1)
reverse light(1)			wheels fold to make car float(1)
tail lights(1)			playstation four(1)
horn(1)			megaphone(1)
			rotating chainsaw(1)
			time machine(1)
			force-field(1)
			flying car(1)
			curtain(1)
			hot tub(1)
			magnet(1)
			no tyres(1)
			present(1)

1) Vehicle safety rating of Australasian New Car Assessment Program; 2) Pay television includes Foxtel.com.au; 3) Auxiliary port.

### 3.1 Standard vehicle features

At least one standard vehicle feature was noted on 117 posters (76.7% of QLD posters; 77.0% of NSW posters). As can be seen, the most common standard vehicle features included headlights, steering wheel, seat and seatbelts, exhaust pipe and tyres. The least common standard vehicle features included reverse and tail lights, rear-view mirrors and the horn.

### 3.2 Safety vehicle features

One or more safety vehicle feature was noted on 56 posters (23.3% of QLD posters; 40.2% of NSW posters). Overwhelmingly, the most common safety vehicle features noted were airbags. The least common standard vehicle features included baby seat anchors and blind spot cameras.

### 3.3 Luxury vehicle features

At least one luxury vehicle feature was noted on 135 posters (96.7% of QLD posters; 86.9% of NSW posters). The most common luxury vehicle features increased the visual appeal of the vehicle through rims and paint, car body attachments and extra lights (in addition to headlights, brake lights, hazard lights, and indicator lights—see standard vehicle features); other luxury vehicle features increased the driver's comfort (e.g., seat warmer, air conditioner); and some luxury features increased the ease of vehicle control (e.g., cruise control, automatic windows).

### 3.4 Bizarre vehicle features

One or more bizarre vehicle feature was noted on 63 posters (23.3% of QLD posters; 48.4% of NSW posters). Surprisingly, the most common bizarre vehicle features noted included guns and armouries<sup>(3)</sup>, followed by passengers and stickers protruding from wheels; with very odd suggestions including TNT (trinitrotoluene) on the bottom of the vehicle, a self-destruct button, and no tyres which seem to significantly reduce their road safety for no clear purpose.

### 3.5 Other vehicle features

At least one other vehicle feature was noted on 19 posters (10.0% of QLD posters; 13.1% of NSW posters). Features related to navigation (e.g., GPS) and telecommunications (e.g, Bluetooth, phone, AUX port, wifi, internet access, phone pocket).

### 3.6 Exploratory analyses

All features failed to meet the Chi-square tests of the lowest expected frequency hypothesis. Independent T-tests revealed that NSW students included more features in total, and for each feature type, except "luxury features" (as seen in Tab. 2). Differences in the average number of features between the two states were statistically significant for each feature type, except for "other" features.

**Tab. 2** Relationship between students' state and the average number of poster features, by feature category

feature	new south wales mean	queensland mean	p
total <sup>1)</sup>	7.24 <sup>3)</sup>	5.97	0.012
standard <sup>1)</sup>	2.38	1.61	0.020
safety <sup>1)</sup>	0.89	0.39	0.008
luxury <sup>1)</sup>	2.71	3.45	0.057
bizarre <sup>1)</sup>	1.08	0.45	0.007
other	0.17	0.06	0.113

1) Equal variances not assumed; 2) Equal variances assumed; Bold indicates statistically significant differences.

## 4 Discussion

Most of the "perfect car" posters focused upon luxury; nearly every poster in Queensland had at least one luxury feature, and nearly 90% of posters overall featured at least one luxury feature. In comparison, only one third of posters had at least one safety feature, with 40% of New South Wales posters and only 20% of Queensland posters noting a safety feature. Nearly half of the posters from New South Wales, and one quarter of the posters from Queensland, included at least one bizarre feature; some of which could be arguably perceived as ridiculous indeed. Surprisingly, one quarter of posters did not include any standard vehicle features; some participant groups may have assumed that standard vehicle features (in addition to the poster template which depicts only the car body, external mirrors, and tyres, headlights) were assumed to be included. The other vehicle features such as GPS and Bluetooth may become standard vehicle features over time, with approximately 12% of posters noting these other vehicle features.

These findings have implications for policy and practice to improve the road safety outcomes for young drivers, particularly given that although the GDL (Graduated Driver License) programs between the two Australian states are different, the perfect cars in the heart of young drivers featured similar characteristics (NSW posters featured more characteristics). Moreover, there are important policy-making and practice implications for drivers of all ages and all driving experiences, including rapidly-motorising nations such as China. With respect to standard vehicle features, drivers need to be aware of the purpose of these features, and their importances in helping to improve road safety, with research consistently demonstrating that the car safety is a critical contributor to the crash<sup>[32-33]</sup>. For example, lights such as headlights, brake lights, reversing lights, indicators, and hazard lights are important to alert other road users to the behaviour of the driver (such as indicators showing a change of direction), and to improve safety in hazardous conditions (such as headlights at night and in wet

weather). The paucity of these standard vehicle features in posters suggests that the teens may not be aware of the important road safety role that these seemingly-obvious features play, particularly as teens were prompted “don’t forget to list all the features you would want” throughout the activity. With respect to vehicle safety features, teens, parents and all drivers need to be aware again of the purpose of these features, and their importance in helping to improve road safety outcomes. Therefore, it is recommended that the young drivers including their parents, their driving instructor, vehicle manufacturers and government key figures<sup>[31,34]</sup> inculcate safety factors as deeply as possible in the driving process before learners get a driver’s license. In this way, teenagers can get clear information about vehicle safety through various channels. Specific policies and practices are to formally teach teenagers about driving safety before and after they get a driver’s license (e.g., learner license, provisional license, intermediate license and restricted license). Multiple supporting resources are freely available in Australia (e.g., various motoring groups such as the Royal Automobile Club of Queensland “Buying a car”, <http://www.racq.com.au/cars-and-driving/cars/buying-a-car>; the Australasian New Car Assessment Program, <https://www.ancap.com.au/>; and the QLD licensing authority Transport and Main Roads “Safe cars”, <http://jointhdrive.qld.gov.au/safe-cars>).

Regarding luxury vehicle features, it appears that the teens already have a preconceived image of their perfect car whether they are learning to drive (learner license), independently-licensed (provisional license), or yet to be licensed altogether (pre-license), and each group design many luxury elements. The safety risks associated with these luxury features for all drivers merit consideration. For example, some features can benefit drivers, including increasing the convenience of vehicle control through mechanisms like cruise control, and increasing the driver’s comfort through air conditioner, while other features such as nitrous are designed to increase the vehicle’s speed which is highly problematic for young and novice driver road safety. In addition, some of the vehicle features indicate that, in the Australia, the teen driver would be prohibited from driving their “perfect car”, graduated driver licensing restrictions preventing young drivers from driving high-powered vehicles with features such as turbo engines<sup>[35]</sup>.

The study findings must be interpreted within the context of a number of advantages and disadvantages. The study examined the “perfect car” responses of approximately 900 teens attending a number of high schools in two Australian states during 2014. Given the stability of the findings across the jurisdictions, it is likely that sampling across other jurisdictions would yield similar results. The teens had a maximum of five minutes to complete their “perfect car”, therefore some important features may have been omitted. As noted earlier, however, what appears in a short period of time is the significant element of this article, therefore the

short timeframe is preferred. Despite the controversy, “salient features” are still likely to be the most influential considerations in vehicle purchasing. In addition, it is noteworthy that while teens may have assumed that the template of the car upon which they were to draw included standard features such as a steering wheel (note that it is not depicted in Figure 1), and that safety features such as ABS which it may be suggested cannot be drawn as features themselves on the shell as depicted in Figure 1, there are numerous instances in which teens wrote the word “ABS” and pointed an arrow at the undercarriage of the vehicle. The research approach also provided unique insight via pictorial representations of what teens want to drive, information which traditionally is collected via other means (e.g., survey, interview). The Author observed multiple drawing sessions in QLD, noting that each group appeared to find the activity fun and engaging, and while typically one “artist” was designated for each poster, all teens actively engaged and contributed to the activity. Therefore, this methodology appears to be a unique way to collect information and set up intervention materials for specific vulnerable road users.

Future research could consider the influence of group-specific gender and age relationships upon featured poster characteristics, in addition to an examination of how the group members interact, the criteria used to (not) include features, and how to choose in the perfect car poster drawing process (when necessary). Moreover, teens could be asked to justify why (not) they drew the specific perfect car features in which they, their friends, and their family would be travelling, during the class presentation. In the meantime, discussion regarding the costs of new and second-hand vehicles with (out) various safety features could be undertaken during the class presentation period. Insight gained through student-moderator and student-student discussions could further inform intervention in this critical realm for young driver road safety. The poster (and the moderator instructions) did not suggest that teens could modify the nature of the vehicle (such as utility or four wheel drive), while factors such as the age of the vehicle or the cost of the vehicle also were not specifically discussed. Such factors are influential in young driver road safety, with recent US research indicating that teens are likely to drive mid-size to large cars that are 10–16 years old<sup>[10]</sup>.

Consideration as to how teens can be encouraged to “postpone” their interest in luxury vehicle features to a period when they are more experienced drivers<sup>[36]</sup>, and to encourage a focus upon safety vehicle features, is warranted. Teens (and indeed, many parents specifically and drivers more generally) may simply be unaware of exactly how electronic stability control helps keep the vehicle occupants safe through mitigating crash risks arising from instances in which the driver loses control of the vehicle through, for example, over-steering or when losing traction on slippery roads. Given the importance of parents in the teen’s

acquisition of a vehicle (e.g., “handing down” of an older family vehicle, or subsidizing the purchase of a new vehicle<sup>[16]</sup>), parents could also engage in a similar exercise in which they design the “perfect car” for their inexperienced child, prior to finalising any handing-down or purchasing arrangements. The teen- and parent-focused research could be undertaken in other motorised jurisdictions, thus providing evidence into teen preferences for luxury over safety, thereby informing practice and policy in multiple jurisdictions for more young drivers. Research into pedestrian safety in pedestrian-vehicle incidents in Guangdong Province has provided some insights into the role of vehicle safety, with recommendations including regular vehicle safety inspections<sup>[37]</sup>, there is a dearth of research investigating car-purchasing considerations in rapidly-motorising nations such as China, and given the safety-critical role that vehicle safety plays, such research is of critical importance.

## 5 Conclusions

Researchers, practitioners, and policy-makers alike need to be aware that our youngest and most inexperienced drivers whether they have attained a license or are yet to do so have an internalised image of their ideal vehicle. This internalised image may be reflected in the characteristics of the car they or their parents purchase, therefore salient features are of great importance. Overwhelmingly, teens’ perfect cars have an abundance of luxury features like flames that are painted on the side of the vehicle suggesting that salient features like appearance are a greater priority to teens than safety features such as electronic stability control.

## 6 Practical applications

Teens appear to rate features other than safety very highly in their “perfect car”, and it is likely these non-safety-focused features similarly rate highly in vehicle purchase decisions. Both parents and teens need to be educated regarding risks associated with non-safety-focused features and the benefits associated with safety features with consideration of insurance or other incentives for purchasing and driving safer vehicles. Safety education should target all drivers (and passengers).

(1) Young drivers typically refer to drivers who are aged 16–24 years. Novice drivers typically refer to drivers with less than five years unsupervised driving experience (these drivers will hold a learner/probationary license then a provisional/restricted / intermediate license, before full/unrestricted/open license).

(2) Notwithstanding that the sequencing of licensing stages (Learner, Provisional 1, Provisional 2, Open) and driver age requirements (minimum of 16 years, 17 years, 18 years, and 20 years respectively) are the same, there are significant differences between the two states, including the minimum logbook hours (QLD = 100 h, NSW = 120 h), and driving speeds

(QLD = speed limit as indicated by on-road signage, NSW = Learner maximum speed = 0 km/h)<sup>[29]</sup>.

(3) Australia introduced and enforced legislation restricting private gun ownership after the shooting massacre of 35 people in Tasmania in 1996. A national buyback scheme saw more than 700 000 weapons surrendered and destroyed in 1996–1997, and persons seeking to own firearms must undertake a safety course and demonstrate why they must own a gun. Note that “self-defence” is not an acceptable reason for gun ownership. Read more at <http://www.loc.gov/law/help/firearms-control/australia.php>.

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