

Peers and parents influence on young risky behaviors: The case of young drivers

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Abstract: Peers and parents represent powerful sources in modeling young drivers' behavior. This article aimed to analyze the role of peer and parents observed risky driving behaviors such as crossing at red lights, drinking and driving, priority rule violation, and over-speeding on self-reported risky behaviors. One hundred and forty seven participants aged 18-25 (53% men) answered a questionnaire regarding their own risky driving behaviors and those observed of their peers and parents. Results showed that both peers and parents play a significant role in shaping young drivers' behavior. Parents were perceived as safer driving models than peers, but had less influence on young drivers' over-speeding or drinking and driving. The implications of the findings are discussed in light of the countermeasures that could help reduce risky driving such as targeting the negative influence of peers by raising awareness of their potential effect on young drivers' behavior or by altering the social norms that value risk taking, especially when driving.

Keywords: risky driving behavior, peer influence, parents influence, observational learning.

1. Introduction

Road traffic deaths and injuries are a major public health challenge that requires concentrated efforts for effective and sustainable prevention. Despite great progress being achieved in reducing car crashes, the number or fatalities² in the European Union (EU) continues to be higher than expected (European Commission, 2013). It is believed that, in order to attain the EU goal of reducing by 50% the number of car crash fatalities, a reduction of 7% per year should be achieved (European Union, 2015). This reduction rate is actually at 5% per year suggesting that there is still much to be done in order to further improve traffic safety (European Commission, 2013). A particular field, which needs special attention, is that of young drivers. Young drivers still account for almost a quarter of all drivers deaths (Brandstaetter et al., 2012; European Commission, 2013; Organization for Economic Development and Cooperation, 2006), and are one of the most at risk population of drivers (Huang & Winston, 2011) despite efforts taken to

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²According to the World Health Organization (2009), a fatality is any person killed immediately or dying within 30 days as a result of a road traffic injury accident

prevent their involvement in traffic crashes (Delhomme, Dedobbeleer, Forward, & Simoes, 2009). Many factors contribute to the high car crash involvement of young drivers. In young adults the prefrontal cortex, responsible for response inhibition and work memory, is among the latest parts of the brain to mature (Casey, Giedd, & Thomas, 2000) thus making young drivers less able manage complex tasks such as driving. Studies showed that young novice drivers (18-25 years) are more prone to car crashes than older novice drivers (Mayhew, Simpson, & Pak, 2003). Next, the lack of experience (Williams, 2003) leads to frequent underestimation of risk (DeJoy, 1992) and slower reactions to risky situations compared to more experienced drivers (Finn & Bragg, 1986). Crundall and Underwood (1998) showed that novice drivers have less flexible visual search patterns than more experienced drivers, use less other information sources (mirrors), and prefer to look straight ahead for most of the time. Finally, young drivers are particularly susceptible to social influences. Driving is a social task and influences from the traffic environment, as well as from peers and parents, are extremely important in determining if, when, and how much, young drivers will engage in risky behaviors (Arnett, 1992; Jessor, 1991).

Peers and parents are considered to be extremely powerful in modeling adolescent and youth behavior and, due to the significant exposure to their behavioral patterns, represent important sources of observational learning (Ferguson, Williams, Chapline, Reinfurt, & De Leonardis, 2001; Scott-Parker, Watson, King, & Hyde, 2012). Their role is even more important when considering risky behaviors, as they can play, through their own behaviors, either a deterrent or an encouraging role (Taubman - Ben-Ari, Musicant, Lotan, & Farah, 2014; Ulleberg, 2002).

Peers influence on adolescents and young behavior has longtime been studied. Peers have been frequently linked to different risky behaviors such as binge drinking (Durkin, Wolfe, & Clark, 2005; Phua, 2011), drug consumption (Srnick, 2007), or smoking (Harakeh & Vollebergh, 2012; Peters et al., 2005). These studies show that a general positive attitudes of peers toward a risky behavior increases the likelihood of that behavior happening (Peters et al., 2005). Also, as the number of peers performing that risky behavior increases, thus creating the perfect conditions for observational learning to happen, so does the probability of that behavior to be performed (Akers, 2009). Peer influence on young drivers' risky behaviors is still considered controversial. Some studies have indicated a negative effect of peer presence as passengers (increased risk of car crash - Chen, Baker, Braver, & Li, 2000; Simons-Morton, Lerner, & Singer, 2005) while others highlighted a rather positive one (reduced risk of car crash - Engstrom, Gregersen, Granstrom, & Nyberg, 2008; Rueda-Domingo et al.,

2004). However, most studies agree that peers' driving behavior has an influence on young drivers' driving behavior. For example, perception of peers' speeding or drinking and driving predicted young drivers self-reported speed (Møller & Haustein, 2014) and drinking and driving (González-Iglesias, Gómez-Fraguela, & Sobral, 2015). Furthermore, peer risk taking behaviors (related or not to driving) were linked to higher intention to speed of young drivers (Simons-Morton et al., 2012). These studies seem to indicate that peers can influence young drivers' behavior by exposing them to risky behaviors, and thus increasing the probability of those behaviors to be reproduced by young drivers in various traffic settings.

Parents have also been linked to various young risky behaviors. Children whose parents use drugs, smoke or drink have a higher involvement in these risky behaviors (Green, Macintyre, West, & Ecob, 1991; Loureiro, Sanz-de-Galdeano, & Vuri, 2010; Smart & Fejer, 1972). More and more evidence is suggesting that the risky driving of young drivers could be associated with parental risky driving (Bianchi, 2004; Brookland & Begg, 2011). Parents who have a history of at-fault collisions and traffic violations were found to have youth with poor driving records (Ferguson et al., 2001; Wilson, Meckle, Wiggins, & Cooper, 2006). Furthermore, Schmidt, Morrongiello, and Colwell (2014) found that parental modelling is more predictive of youth risk taking driving behavior than parental teaching. According to Taubman-Ben-Ari and Katz-Ben-Ami (2012), the perception of riskiness is more important than actual risky behaviors. In their study, they found that the mere perception of parent riskiness had an influence on young drivers: those who perceived their parents as being safe drivers were reported being safer, less-aggressive drivers than those who perceived their parents as unsafe drivers (Taubman-Ben-Ari & Katz-Ben-Ami, 2012). These studies seem to suggest that parental driving behavior represents an important source of observational learning, and that young drivers may model their driving behavior accordingly.

Some studies seem to indicate that peer influence is more important than parent's influence, especially for risky behaviors such as marijuana and other drug use, drinking, or smoking (Akers & Lee, 1996; Bahr, Hoffmann, & Yang, 2005; Dishion & Loeber, 1985). This might be correct for some risky behaviors, while for other, no. Driving is usually a individualistic activity, as the car rate of occupancy is quite low in EU (European Environmental Agency, 2009; International Energy Agency 1997). Therefore, young drivers' exposure to peers and/or parents driving behavior should be limited making it difficult to anticipate whether peers or parents will play a more important role in modelling their driving behavior.

This study will focus on the analysis of several risky driving behaviors that have been proven to increase the risk of car crashes. Speeding is considered to be the leading cause of car crashes and fatalities and is the most frequent violation (Delhomme, 2002; Hassan & Abdel-Aty, 2012). Regarding young drivers, speeding is particularly dangerous as they lack the proficiency of hazard detection and response (Committee on Injury, Poison Prevention, & Committee on Adolescence, 2006). Drinking and driving is responsible for 25% of all road fatalities in EU (SafetyNet, 2009) and in the case of young drivers it is believed that it increases six times their car crash risk when driving with a blood concentration of 0.05 g/l than without drinking (Veldstra et al., 2012; Wickens et al., 2012). Priority rule violation are the most frequent causes for crashes happening on roundabouts and intersections (Al-Saleh & Bendak, 2012) and running red traffic lights was identified in the proposal from the European Parliament and the Europe Council for a directive facilitating cross-border enforcement in the field of traffic safety as one of the greatest causes of crashes (Commission of the European Communities, 2008).

This study aims to investigate the role of peer and parents influence on young drivers' risky behaviors. We expect to find a positive link between peers, parents, and self-reported risky behaviors. We also anticipate that peers will be perceived as performing more risky behaviors such as crossing at red lights, drinking and driving, priority rule violations, and over speeding than parents.

2. Method

The aim of the study was explained to each participant and an informed consent was signed by everyone who took part in the study. No rewards, financially or otherwise, were offered in return for participation.

2.1 Sample

One hundred and eighty participants answered the questionnaire. Following verifications (they had to have at least one parent who drove regularly, as well as a friend), only the answers of 147 young drivers were used for further analysis. Participants were aged 18 to 25 ($M = 21.97$, $S.D. = 1.99$), 53% men. Twenty five percent of participants had their driving license for 2 years ($M = 3.14$, $S.D. = 1.80$) and drove 12,869 km ($S.D. = 23,607$ km) in 2010/2011.

2.2 Measures

All participants were asked to assess how often they performed and observed their peers or parents performing certain traffic risky behaviors. Four different risky driving behaviors were chosen: crossing at red lights,

drinking and driving, over-speeding and priority rule violation. These behaviors are considered to be some of the dangerous (Chen et al., 2009). Each participant had to assess on a scale from 1 (never) to 4 (always) the frequency of each behavior. For each risky behavior, participants had to make three assessments: self-reported frequency, peers observed frequency, and parents observed frequency.

- Crossing at red lights was assessed through 1 item: *During the last three months, you failed to stop at red lights. During the last three months, you observed your parents/peers failing to stop at red lights.*

- Drinking and driving was assessed through 1 item: *During the last three months you drove after drinking. During the last three months, you observed your parents/peers driving after they had been drinking.*

- Priority rule violation was assessed through 1 item: *During the last three months you did not give way to other drivers. During the last three months, you observed your parents/peers not giving way to other drivers.*

- Over-speeding was assessed through 2 items and the mean was used in the following analysis: *During the last three months, you failed to respect speed limitations. During the last three months, you observed your parents/peers failing to respect speed limitations.*

The second part of the questionnaire comprised socio-demographic information such as age, gender, driving experience, number of kilometers driven in the previous year, as well as information about accidents and contraventions.

3. Results

3.1 Descriptive statistics

The most frequently reported behavior for all three populations (self-reported, observed parents, and peers) was over-speeding, ($M_{10}= 2.95$, $M_{11}= 2.52$, $M_{12}= 1.96$) while drinking and driving was the least frequently reported behavior ($M_4 = 1.23$, $M_5= 1.54$, $M_6= 1.22$). On priority rule violations and on over-speeding the means were higher for self-reported ($M_7 = 1.82$, $M_{10} = 2.95$) and lower for peers observed behavior ($M_8 = 1.69$, $M_{11} = 2.52$), while for drinking and driving and crossing at red lights, the means were higher for peers observed behavior ($M_5 = 1.54$, $M_2 = 1.53$) that for self-reported behavior ($M_7 = 1.23$, $M_1 = 1.39$). Generally, for all the behaviors assessed, parents observed risky behaviors obtained the lowest mean.

Results showed that self-reported transgressions usually correlate between them. For example, self-reported crossing at red lights and self-reported drinking and driving ($r = .26, p < .0001$). Self-reported crossing at red lights also correlated with self-reported priority rule violation ($r = .21, p < .05$) and over-speeding ($r = .25, p < .0001$).

This was also found for peers' observed risky behaviors and for parents' observed risky behaviors. For instance, a high and positive correlation was obtained between peers observed drinking and driving and peers observed over-speeding ($r = .43, p < .0001$). For parents observed risky behaviors, an example is the correlation found between crossing at red lights and priority rule violation ($r = .25, p < .0001$). It is worth highlighting that the correlations obtained between parents' observed risky behaviors were lower than for self-reported and peers' observed risky behaviors.

All self-reported risky behaviors correlated with peers and parents' observed risky behaviors. The highest correlation between self-reported and peers' observed risky behaviors was found on over-speeding ($r = .50, p < .0001$) followed by priority rule violation ($r = .33, p < .0001$), crossing at red lights ($r = .27, p < .0001$), and finally drinking and driving ($r = .24, p < .0001$). The highest correlation between self-reported risky behaviors and parents' observed risky behaviors was found on over-speeding ($r = .40, p < .0001$), followed by crossing at red lights ($r = .32, p < .0001$), priority rule violation ($r = .33, p < .0001$), and finally drinking and driving ($r = .28, p < .0001$).

Self-reported risky behaviors on priority rule violation and over-speeding correlated with self-reported number of crashes crossing at red lights ($r = .29, p < .0001, r = .17, p < .050$), while self-reported number of contraventions correlated only with self-reported over-speeding ($r = .22, p < .0001$).

3.2 Differences between self-reported, peer and parents observed risky behaviors

In order to test whether peers were perceived as performing more risky behaviors than parents, a one way ANOVA has been employed for each risky behavior. The results of the ANOVA are presented in Table 1. Self-reported, the observed peers' and parents' risky behaviors (assessed person) were compared on crossing at red light, drinking and driving, priority rule violation, and over-speeding. The assumption of homogeneity of variance was violated for all risky behaviors [$F_{red\ lights}(2, 437) = 25.71, p = .001$; $F_{drinking\ and\ driving}(2, 438) = 18.84, p = .001$; $F_{priority}(2, 438) = 23.42, p = .001$; $F_{over-speeding}(2, 437) = 41.76, p = .001$] therefore Welch's F -ratio was reported and Dunnett's T3 post hoc tests were used.

Table 1 Assessed Person Differences on Risky Behaviors

Risky behavior	Assessed person			F
	Self-reported	Peers	Parents	
Red lights	1.39 _a (.81)	1.53 _b (.67)	1.13 _a (.44)	18.91**
Drinking and driving	1.23 _a (.54)	1.54 _b (.59)	1.22 _{ac} (.45)	14.66**
Priority rule violation	1.81 _a (.94)	1.68 _a (.57)	1.31 _b (.47)	27.14**
Over-speed	2.95 _a (1.20)	2.51 _b (.71)	1.96 _c (.60)	50.10**

Note. * = $p < .05$, ** = $p < .001$. Standard deviations appear in parentheses below means. Means with differing subscripts within rows are significantly different at the $p < .05$ based on Dunnett's T3 post hoc comparison

There was a significant effect of the assessed person on crossing at red lights [$F(2, 273.66) = 18.91, p = .001$], on drinking and driving [$F(2, 287.52) = 14.66, p = .001$], on priority rule violation [$F(2, 276.98) = 27.14, p = .001$], and on over-speeding [$F(2, 276.45) = 50.10, p = .001$].

For crossing at red lights there was a significant difference between self-reported and observed parents behavior ($p = .03, d = .25$), and between parents and peers observed behavior ($p = .001, d = -.39$), but no significant difference was found between self-reported and observed peers behavior ($p = .31, d = -.13$).

For drinking and driving, there was a significant difference between self-reported and observed peers' behavior ($p = .001, d = -.30$), and between peers and parents' observed behavior ($p = .001, d = .31$). However, no significant difference was observed between self-reported and observed parents' behavior ($p = .99, d = .01$).

For priority rule violation, there was a significant difference between self-reported and observed parents' behavior ($p = .001, d = .50$), and between parents and peers' observed behavior ($p = .001, d = -.37$). No significant difference was found between self-reported and peers observed behavior ($p = .39, d = .12$).

For over-speeding, there was a significant difference between self-reported and peers observed behavior, ($p = .001, d = .44$), self-reported and parents observed behavior, ($p = .001, d = .98$), and observed peers and parents behavior, ($p = .001, d = .54$).

3.3 Peers and parents' role in predicting self-reported risky behaviors

Next, we wanted to investigate the importance of peers and parents' observed risky behaviors on self-reported crossing at red lights, drinking and

driving, priority rule violation, and on over-speeding. We expected to observe a higher influence of parents observed risky behaviors on young drivers' self-reported behavior due to the greater exposure of the young driver to their driving model. In order to attain this goal a multiple regression with Stepwise method was used. The predictors used in the analysis were observed peers and parents crossing at red lights, drinking and driving, priority rule violation, and over-speeding. Our decision was based on previous results which have shown that perceived risky behavior does not have to be specific to a certain traffic violation in order to influence young drivers' risk taking (Simons-Morton et al., 2012). Results are summarized below.

Table 2 presents the results obtained for predicting self-reported crossing at red lights. Results seem to suggest that the best predictor of self-reported crossing at red lights was observed parents' behavior of crossing at red lights. The next predictors were peers and parents observed priority rule violation behavior.

Table 2 Stepwise Regression Analysis for Self-Reported Crossing at Red Lights

	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE (B)</i>	β	<i>B</i>	<i>SE (B)</i>	β	<i>B</i>	<i>SE (B)</i>	β
Parents crossing at red lights	.85	.13	.47**	.80	.13	.48**	.88	.13	.48**
Peers priority rule violation				.23	.10	.16*	.33	.10	.23**
Parents priority rule violation							.37	.13	.21*
R^2	.21**			.24**			.28**		
F for change in R^2	40.91**			4.78*			8.01**		

* $p < .05$. ** $p < .001$.

Table 3 presents the results of the regression analysis on drinking and driving. Results seem to indicate that the best predictor of self-reported drinking and driving was peers' observed behavior of drinking and driving.

Table 3 Stepwise Regression Analysis for Self-Reported Drinking and Driving

Model 1			
	<i>B</i>	<i>SE (B)</i>	β
Peers drinking and driving	.24	.07	.26**
R^2	.07**		
<i>F</i> for change in R^2	10.72**		

* $p < .05$. ** $p < .001$.

As seen in Table 4, the best predictor of self-reported priority rule violation was observed peers' priority rule violation.

Table 4 Stepwise Regression Analysis for Self-Reported Priority Rule Violation

Model 1			
	<i>B</i>	<i>SE (B)</i>	β
Peers priority rule violation	.53	.13	.32**
R^2	.09**		
<i>F</i> for change in R^2	16.42**		

* $p < .05$. ** $p < .001$.

Finally, table 5 presents the results of the regression analysis on self-reported over-speeding. The best predictor was peers observed over-speeding behavior, followed by parents observed over-speeding, and peers observed drinking and driving.

Table 5 Stepwise Regression Analysis for Self-Reported Over-speeding

	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE</i> (<i>B</i>)	β	<i>B</i>	<i>SE</i> (<i>B</i>)	β	<i>B</i>	<i>SE</i> (<i>B</i>)	β
Peers over-speeding	.85	.12	.49**	.68	.13	.39**	1.14	.23	.66**
Parents over-speeding				.43	.16	.21**	.48	.15	.24**
Peers drinking and driving							.66	.28	.32*
R^2	.24**			.27**			.30**		
F for change in R^2	47.51**			7.53**			5.45*		

* $p < .05$. ** $p < .001$.

4. Discussions and conclusion

The aim of this paper was to investigate the role of the observed peers and parents' risky behaviors on young drivers' self-reported risky behaviors (crossing at red lights, drinking and driving, priority rule violation, and over-speeding). We expected to find positive relations between peers, parents' and self-reported behaviors and that peers will be perceived as engaging more frequently in risky behaviors than parents.

Overall, the results seemed to indicate that peers and parents represent significant sources of influence on young drivers' risky behavior. Peers had a greater influence on drinking and driving, priority rule violation and over-speeding, while parents had a more significant influence on crossing at red lights. Overall, results seem to indicate that parents were perceived as safer drivers compared to peers.

The most frequently reported behavior was over-speeding. Young drivers admitted that themselves, their peers, as well as their parents, disregard the speed limits. This is not uncommon as speeding is recognized the most frequently self-reported transgression (Delhomme, 2002; Hassan & Abdel-Aty, 2012). However, over-speeding remains one of the most dangerous risky behaviors, especially for young drivers who lack the ability to proficiently detect and respond to potential hazards (Garvill, Marell, & Westin, 2003).

The results also showed stronger relations between self-reported and peers observed risky behaviors than for self-reported and parents observed risky behaviors. This may indicate that peers observed behaviors may play a more important role in shaping young drivers' risky behaviors.

Parents have the lowest scores on all risky behaviors and are significantly different from those of peers. This could suggest that young drivers may perceive their parents as safer drivers compared to their peers. Young drivers seemed to consider their peers as more risky drivers than themselves, but only on behaviors such as drinking and driving, and crossing at red lights. However, on over-speeding and priority rule violation they perceived their peers as less risky than themselves. A possible explanation for these results may be the degree of visibility of the risky behavior. Drinking and driving as well as failing to stop at red lights are highly visible behaviors, easily noticeable from a passenger's perspective. However, for example, the speedometer is less visible for all passengers.

Finally, regressions results indicated that both peers and parents were sources of influence that can potentially model young drivers' behavior. These results are consistent with those of other studies which found that peers and parents significantly influence young risky behaviors (Dishion & Loeber, 1985; Scott-Parker, Watson, King, & Hyde, 2014; Scott-Parker, Watson, & King, 2009). It is important to highlight that our analysis seemed to suggest that the role of observed peers' risky behavior in explaining young drivers' over-speeding and drinking and driving was greater than the role of observed parents' behaviors. Thus, the exposure to a perceived safer driver model, as the case of parents, does not suffice to deter young drivers' from engaging in risky driving behaviors.

Young drivers seemed to relate more to the driving behavior model of their peers than of their parents. A possible explanation for these results could be that peers usually encourage different risky driving behaviors such as speeding (CHOP, 2009) by asking, explicitly or implicitly, to make the journey more "enjoyable" (Regan & Mitsopoulos, 2001), while parents usually discourage this type of behavior (Simons-Morton, 2007). Furthermore, it is possible that peers actually do perform more frequently those behaviors than the parents. Some findings suggest that young drivers generally drive faster than other group ages (Tseng, 2013) and that young drivers who have peers that over-speed indicated higher self-reported speed (Simons-Morton et al., 2005). An interesting result was that self-reported crossing at red lights was also predicted by perceived peers and parents' priority rule violation and that self-reported over-speeding was also predicted by perceived peers' drinking and driving. These results seem to suggest that specific risky behaviors can be influenced by other risky behaviors than the behavior in question. Several explanations could be considered for these results. Simons-Morton et al. (2011) found that peers' risk taking behavior in general had a significant impact on young driver's speed, such that young drivers with perceived high risk taking peers drove faster than young drivers with perceived low risk taking peers. Thus, a specific risky behavior (i.e. over-speeding) could be influenced by other

observed risky behavior (i.e. peers drinking and driving). Another explanation could be that some behaviors are simultaneous, thus the exposure to one supposes exposure to the other behavior. For example, studies have shown that drinking and driving is often associated with over-speeding (European Transport Safety Council, 2012; Hingson, Howland, & Levenson, 1988).

These findings could have important practical applications. Taking into account that our results suggested that peers have somewhat a bigger influence on young drivers' risky behaviors, specific interventions targeting peer influence should be considered. As many authors suggested, young drivers' intervention programs should be tailored to the needs and motivation of the population targeted (Dinh-Zarr et al., 2001; Rosenbloom, Levi, Peleg, & Nemrodov, 2009; Twisk & Stacey, 2007). Therefore, young drivers could be trained to acknowledge and identify the existence of peer influence on their driving behavior, as well as techniques for countering/avoiding its effects. Moreover, interventions aiming at changing the social norm that value risk-taking could also be effective (Scott-Parker et al., 2014). Young adults could be advised to discourage risk-taking behaviors by sanctioning it when it appears. Finally, both peers and young drivers could be encouraged to be good role models of good driving behavior, thus exposing other drivers to safe driving behavior. Parents could be advised to display safety-oriented driving behaviors so that their children would be exposed to a safe driving model and to encourage their children to pattern their behavior.

This study presents several limitations. First of all, the sample we analyzed was small. Also, self-reported behaviors are known to be prone to biases such as impression management, and thus the findings must be cautiously interpreted. Finally, another potential limitation could be the period of time we have used for assessing observed peers and parents' risky behaviors (three months).

In conclusion, our results seemed to reinforce previous findings that reported peers and parents as important sources of observational learning (Fryling, Johnston, & Hayes, 2011). These results could be further analyzed by using the framework of Akers' Social Learning theory (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979) that will allow to better control the role of peers and parents, the rewards and/or punishments, not only the influence of observed peers and parents' risky behaviors. Social learning theory, to our knowledge, has not yet been extensively applied to traffic studies. Only two other articles have already used this framework in order to understand young drivers' behavior with some interesting results (Scott-Parker et al., 2012, 2014). Thus it could be useful to apply it also to young drivers from Romania.

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