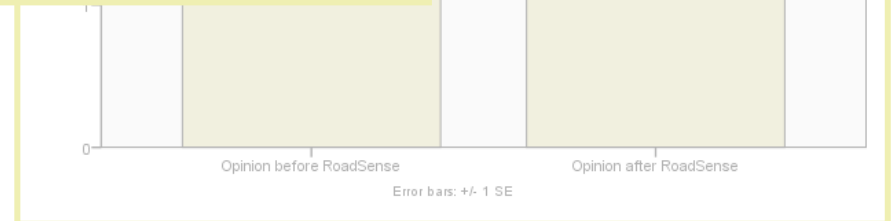
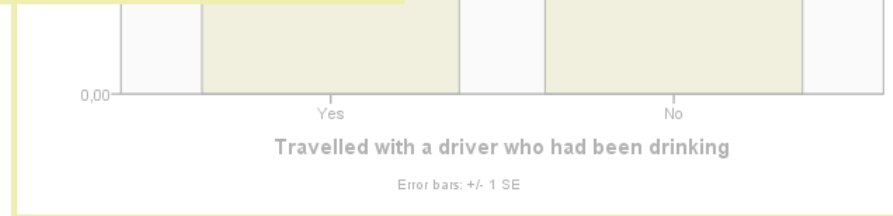
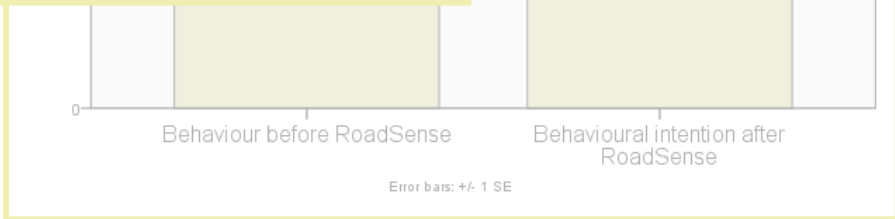


RoadSense in Fryslân: a success?

Effects on behavioural intention and opinions



Colophon

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Content of the project: This report presents a study that investigates the magnitude and nature of the road risk of young car passengers in the south-east of Fryslân, the Netherlands. Questionnaires were held before and after participation of young passengers in the RoadSense programme, and questioned them about their behavioural intentions and opinions.

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Effecten RoadSense-programma Oosterwolde in het kort

Dit is een korte samenvatting van de resultaten van het RoadSense-programma zoals uitgevoerd onder leerlingen van het Stellingwerf College in Oosterwolde, op het Verkeers-educatiecentrum (VEC) in Drachten. Alvorens op de evaluatieresultaten in te gaan, behandelt deze samenvatting eerst kort het verkeersveiligheidsprobleem van jonge passagiers en het nut van programma's zoals RoadSense.

Achtergrond en doel van programma RoadSense

Van alle overleden autopassagiers in Nederland is meer dan een derde een jongere in de leeftijdscategorie 10-24 jaar. Het merendeel overlijdt in een auto met een 18- tot 24-jarige achter het stuur. Deze aandelen zijn veel groter dan je op grond van de bevolkingssamenstelling zou mogen verwachten (SWOV, 2012). Er zijn vier mogelijke verklaringen, die ten dele al door eerder onderzoek zijn bevestigd:

- Jonge passagiers leggen het overgrote deel van hun passagierskilometers af als passagier van een jonge bestuurder. Of dit ook feitelijk zo is, is door het gebrek aan de noodzakelijke gegevens nog niet vast te stellen.
- Jonge bestuurders hebben door hun mentale onvolwassenheid en gebrek aan ervaring een verhoogd ongevalsrisico; passagiers van deze jonge bestuurders staan dus bloot aan datzelfde verhoogde risico. Dit is een feit dat al door veel onderzoek is bevestigd.
- Jonge passagiers hebben te maken met groepsdruk, waardoor bestuurders zich vaker riskant gedragen als zij

leeftijdsgenoten als passagiers vervoeren. Dit blijkt bijvoorbeeld uit Amerikaans onderzoek, maar of dat ook onder Nederlandse jongeren een grote rol speelt is nog niet onderzocht.

- Jonge passagiers zijn door hun gedrag een bron van afleiding voor de beginnende bestuurders. Dit blijkt ook uit Amerikaans onderzoek, maar is ook nog niet onderzocht onder Nederlandse jongeren.

Het programma RoadSense is in Nederland een van de weinige programma's die zich richten op de doelgroep 'jonge passagiers'. Dit door Mercedes-Benz ontwikkelde programma heeft tot doel het probleembewustzijn bij jongeren van 13 tot 16 jaar te vergroten en hun houding en gedrag als passagier te verbeteren. Het programma biedt aan kleine groepen praktische demonstraties, waaronder het zelf autorijden op een verkeersoefenterrein. Daarnaast worden jongeren in een groepsdiscussie gestimuleerd om hun eigen gedrag en dat van anderen kritisch te bezien. Eerder onderzoek liet zien dat het programma positieve effecten heeft op het voorgenomen gedrag en ook op het veiligheidsbewustzijn (Twisk & Vlakveld, 2011).

Doel van het onderzoek

De provincie Friesland heeft de SWOV opdracht gegeven onderzoek te doen onder Friese jongeren. Dit onderzoek had drie doelen:

1. het in kaart brengen van de omstandigheden waarin Friese jongeren zich als passagier blootstellen aan gevaarlijk rijgedrag;
2. het in kaart brengen van hun meningen over gevaarlijk rijden en passagiersgedrag en hun beleving van het risico daarvan;
3. het vaststellen van het effect van RoadSense op het voorgenomen gedrag (gedragsintenties) en op hun meningen en risicobeleving.

Uitvoering van het onderzoek

Leerlingen van het Stellingwerf College, gevestigd in Oosterwolde, hebben vlak voor het RoadSense-programma en vlak erna, een vragenlijst ingevuld. De vragenlijst voorafgaande aan het programma had tot doel om te achterhalen hoe vaak jongeren al te maken hebben gehad met gevaarlijk rijgedrag van hun bestuurders. De vragenlijst na de cursus bekeek of jongeren na de cursus zeiden dat ze van plan waren zich anders te gaan gedragen, bijvoorbeeld door niet meer in te stappen bij een bestuurder die gedronken had. Deze opzet maakt het mogelijk om direct na de deelname al een beeld te krijgen van de voorgenomen gedragingen. Helaas zeggen de resultaten dus alleen iets over de effecten op de 'goede voornemens' op de zeer korte termijn. De resultaten kunnen dus niets zeggen over de *langetermijneffecten* op de gedragsintenties en over de effecten op *het feitelijke gedrag*.

Resultaten

Hoe vaak en wanneer stellen Friese passagiers zich bloot aan gevaar?

Om na te gaan hoe vaak passagiers van 13 en 14 jaar al te maken hebben gehad met gevaarlijk gedrag van een bestuurder, hoe ze daarmee zijn omgegaan en hoe ze dat beleefd hebben, is bij de 173 jongeren die deelnamen aan de RoadSense-cursus in Drachten een vragenlijst afgenomen. Van deze jongeren bleken 162 de vragenlijst voldoende duidelijk te hebben ingevuld. Net als in een eerdere studie naar het gedrag van jonge passagiers, blijkt uit de antwoorden dat deze jongeren niet 'zomaar' bij iedereen in de auto stappen, maar dat ze daarbij rekening houden met de verwachting of de bestuurder zich wel veilig zal gaan gedragen. Echter, wanneer de bestuurder een vriend is, zijn ze veel minder voorzichtig. 22% van de ondervraagde jongeren (36 uit 162) meldt wel eens meegereden te zijn met een bestuurder die gedronken had. Dit aandeel komt overeen met de 19% die in een eerdere Nederlandse studie is gevonden (Kemler et al., 2007). Veel jonge Friese deelnemers zeggen weleens te maken hebben gehad met bestuurders die te hard reden, zowel ouders (68% van de deelnemers) als vrienden (35% van de deelnemers). Dat is vaker zo bij jongens dan bij meisjes. Jongens stapten vaker dan meisjes in de auto van een vriend waarvan ze wisten dat hij gevaarlijk reed, of van een bestuurder die gedronken had. Zij gaan er vaker blindelings van uit dat elke bestuurder 'wel oké' is, omdat zij menen dat het bezitten van een rijbewijs betekent dat iemand het gevaar goed kan inschatten. Over het algemeen bleken de ondervraagde jongeren zich er weinig

bewust van te zijn dat zij met hun gedrag bestuurders kunnen beïnvloeden en dat zij daarmee medeverantwoordelijk zijn voor hun eigen veiligheid. Ook zien jongens in mindere mate dan meisjes dat het gedrag van passagiers afleidend kan zijn voor de bestuurder. Naast deze verschillen tussen de geslachten, is er ook een verschil tussen leerlingen van verschillende schooltypen. Over het algemeen gedragen jongeren die naar het vmbo gaan zich riskanter en hebben ze ook riskantere meningen dan jongeren die naar de havo of naar het vwo gaan.

Hoe groot is het effect van de cursus?

Jongeren bleken zich voorafgaande aan de cursus regelmatig blootgesteld te hebben aan gevaren. Bovendien bleken ze weinig inzicht te hebben in hoe het gedrag van passagiers de veiligheid in gevaar kan brengen. Na de cursus namen ze zich voor om dit minder vaak te doen en bleken zij hun mening in een veilige richting te hebben bijgesteld.

De omvang van die verbetering onder jongeren verschilt tussen subgroepen, zoals:

- ***Eerdere blootstelling aan gevaar.*** Jongeren die bij ouders in de auto hebben gezeten die vaak te hard reden, verbeterden meer dan jongeren die dat niet hadden meegemaakt. Dit gold niet voor jongeren die met dronken bestuurders hadden meegereden. Beide groepen (*wel* of *niet* eerder met dronken bestuurders meegereden) verbeterden even sterk. Dit kan komen doordat voorafgaande aan de cursus ‘rijden onder invloed’ al afgekeurd werd,

terwijl dat voor ‘te hard rijden’ nog niet het geval was. De cursus heeft dit incorrecte beeld over het gevaar van snelheidsovertredingen dus goed bijgesteld.

- ***Leeftijd en geslacht.*** Beide geslachten en alle leeftijden profiteerden van de cursus, maar meisjes iets meer dan jongens. Dat betekent wel dat de cursus dus niets extra’s doet voor de jongens. Dat is ongunstig omdat deze groep voorafgaande aan de cursus zich al wel vaker dan meisjes riskant bleek te gedragen.
- ***Schooltype.*** Jongeren van havo/vwo en vmbo gaan beide vooruit. Maar jongeren die op het vwo en de havo zitten hebben meer profijt van de cursus dan vmbo-leerlingen. Dit is ongunstig omdat vmbo-leerlingen voorafgaande aan de cursus al vaker ‘gevaarlijke’ meningen hebben, dan havo/vwo-leerlingen.

Beperkingen van de studie

Deze studie heeft alleen naar de effecten op de korte termijn gekeken, en dan ook nog alleen naar de ‘goede voornemens’. Die goede voornemens, weten we uit onderzoek, verzwakken en leiden in vele gevallen niet tot een echte gedragsverandering. Ook al zijn alle deelnemers van plan het anders te doen, dan zal slechts een klein deel dat ook echt doen en dat volhouden. Redenen zijn niet alleen een ‘zwakke wil’, maar ook omstandigheden die weinig alternatieven toelaat. Om het beeld dus compleet te maken is het nodig om ook naar de effecten op de langere termijn te kijken, en ook na te gaan wat de faal- en succesfactoren daarbij zijn.

Conclusies en aanbevelingen

Zijn jonge passagiers ook in Friesland een relevante doelgroep?

Ja, jonge passagiers stellen zich bewust of onbewust bloot aan gevaren. Dat geldt vooral voor jongens en jongeren op het vmbo. Om te kijken welke interventies nodig zijn, is het ook noodzakelijk meer inzicht te krijgen in de achtergronden van dit gedrag.

Is de RoadSense nuttig?

Ja, maar het kan beter. De cursus verbetert het voorgenomen gedrag en de meningen van jongeren. Echter, de cursus zou in kracht toenemen wanneer deze:

- een groter effect heeft dan nu het geval is op de hoogrisicogroepen 'jongens' en 'leerlingen van het vmbo';
- rekening houdt met de eerdere ervaringen van jongeren;
- aandacht besteedt aan de omstandigheden waarin 'vriendschap' in combinatie met 'groepsdruk' een rol speelt;
- ouders erbij betreft, met het doel hun probleembewustzijn en hun vaardigheden te vergroten, waardoor zijn hun 'puber' effectief kunnen ondersteunen en corrigeren.

Is deze studie voldoende om RoadSense grootschalig in te voeren?

Nee, daarvoor is het nodig om ook de effecten op het gedrag op de langere termijn te onderzoeken.

Summary

The Regional Road Safety Council of Fryslân commissioned the present study in order to investigate the magnitude and nature of the road risk of young car passengers in the south-east of Fryslân, and to assess the effects of the RoadSense programme on their behavioural intentions and opinions. Using questionnaires, a before and after study without a control group was carried out among 162 participants in the programme. These questionnaires were administered just before and immediately after participants had attended RoadSense. The results showed a significant number of young passengers to be exposed to dangerous driving, mostly speeding. Young males engaged more frequently in dangerous behaviour and also held more risky opinions than girls did. Also, youngsters who had been passengers with a drunk driver, expressed more risky opinions. After having

completed the RoadSense course, participants had improved their behavioural intentions and opinions. The programme did not have an 'extra' effect on the high-risk groups, such as young males. However, such an extra effect was present in the group who had been riding with a drunk driver. The implications of the findings for programme development were discussed, whereby the limitations of the present study were taken into account. It was recommended to strengthen the programme's impact on high-risk groups, especially on young male passengers, to explore the theme of peer pressure, and to involve parents. To assess the effects on safety, an evaluation is required of the long-term effects of the programme on actual behaviour. Such an evaluation should not solely include a pre- and post-test but also include a control group.

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1 Introduction

1.1 Problem statement

Adolescents love to hang out with friends. Sharing a ride and picking up friends on the way is part of the fun. Youngsters aged 14-16 do not possess a driving licence yet and therefore accept rides from their older friends. This would not be a matter of concern, were it not that these rides may have implications for their current and future safety. An overview of the current literature shows at least three reasons for concern. First, crash figures show that these car trips may expose young passengers to high risks. Young drivers have higher crash rates than experienced drivers, which also endangers their passengers (Vlakveld, 2005). In 2008, 17 passengers died in the car of a young driver in the Netherlands. The crash risk may be even higher when novice drivers carry peer group passengers. However, the evidence is not conclusive on this point. Studies from the US suggest that crash rates increase when passengers are present, but a study among Swedish novice drivers suggested that the presence of passengers has a protective effect (Engström et al., 2008). A second safety concern is that passengers by their presence and behaviour may contribute to the extra risk. For instance by being a source of distraction, by explicitly or implicitly putting pressure on the driver (Gardner & Steinberg, 2005; Steinberg & Monahan, 2007), or by the driver's desire to impress the passengers, and to be 'cool' (Caird & White, 2009). A third

concern is the influence that regular exposure to risky driving may have on the formation of safety attitudes. Studies show that 'bad examples', in particular from 'relevant others', may reinforce the belief that risky driving is not so risky after all. Even high risk driving rarely results in a crash (Waylen & McKenna, 2002).

To date most studies and interventions in the Netherlands have focused on the risk of novice drivers, and almost none on the risks of young passenger in the age category 13-17. As a result no information is available on the nature and magnitude of the risk, the factors contributing to this risk, and the potential effects interventions may have.

RoadSense is one of the first programmes in the Netherlands that targets the behaviour of young passengers between 14 and 16 years of age. The programme aims to increase awareness of risks, to deepen the understanding of the complexity of the driving task, and to create an insight into the potentially positive and negative influences that peer group passengers have on the task performance of novice drivers. Although the programme addresses some relevant issues, little is known about the programme's impact on safety.

This study aims to study behaviour and attitudes of adolescents as passengers and the effects of RoadSense.

1.2 Objectives

The study has three objectives. The first objective is to gather information about the behaviour of young passengers in the south-east of Fryslân, their exposure to risk, their opinions about these risks, and the factors that predict risky behaviours

and opinions. The second objective is to assess the effects of the RoadSense programme on the behavioural intention and opinions of young passengers. The third objective is to study the role of background variables such as age, gender, school type, and previous exposure to risk, in relation to the effects of the RoadSense programme.

2 Method

2.1 Participants

Youngsters participating in the RoadSense programme were also invited to participate in the evaluation study. 173 youngsters participated in the evaluation study. From 162 participants a pre- and post-test questionnaire was available that could be identified as being completed by the same individual. All analyses in the current study were based on these 162 individuals. 53% of the participants were male, and the mean age was 14.9, *SD* = .65. More than half the participants (55%) were from schools for vocational training and the rest attended schools for theoretical higher education (havo and vwo). Participants were aged 14 to 17 years of age: 22% were aged 14, 65% were 15 years old, 10.5% were 16 and 2.5% were aged 17.

A significant number of participants reported to have been exposed to risky driving; 68% reported to have been a passenger of speeding parents, 35% of speeding friends, and 22% of drunk drivers and 23% of careless drivers.

2.2 Questionnaires

The questionnaires were based on those used in a Norwegian study on factors that affect the behaviour of adolescent passengers and their interactions with drivers (Ulleberg, 2004). The questionnaire used in the current study consisted of 8 items on behaviours and 6 items on opinions. A four-point scale was used for each item, and labelled as 'totally true', 'a

bit true', 'untrue', and 'totally untrue'. See *Table 2.1* for an overview of the content of the pre- and post-test questionnaires. Exposure to risky driving was measured for three conditions: 'Having been a passenger of a speeding parent', 'Having been a passenger of a speeding friend' and 'Having been a passenger of a drunk driver'.

	Pre-test	Post-test
Actual behaviour as passengers (8 items)	Actual behaviour	Behavioural intention
Exposure to risky driving (3 items)	Actual exposure	
Opinions (6 items)	Identical on both tests	
Demographics (age, school type gender)	Only on pre-test	
Appreciation of training		Only post-test

Table 2.1: Elements of questionnaire on pre-test and post-test (Questionnaires are available in full in the Appendices 1 (pre-test) and 2 (post-test)).

2.3 Procedure

The questionnaires were administered just before the training and the same day immediately after the training. To ensure anonymity, codes were constructed to enable identification and merging of pre- and post-test questionnaires of the same individual.

2.4 Measures

Scales

To construct scales and to study the progress on the scales, the items were analysed in terms of 'reported behaviour before RoadSense' and 'behaviour intentions after RoadSense'. For instance, 'In future times I will not travel as a passenger with a driver who drives dangerously'. The scale was constructed based on the items 1, 2, 4, 7, 9, 10, 11, and 13 (see for the exact wording of the items *Table 3.1* in the following chapter). The internal consistency of the scale was acceptable ($\alpha = .76$).

A second scale was constructed for opinions (items 3, 5, 6, 8, 12, 14). For instance, 'A driver who speeds is cooler than a driver who always obeys the rules'. For the exact wording of the items, see *Table 3.2*. The internal consistency of the 'opinions scale' was acceptable ($\alpha = .70$). The performance of each participant was calculated as the sum of scores on the items on the pre-test and as the sum of the scores on the post-test.

For each participant, the scores were totalled into the 'Behaviour before RoadSense score' and the 'Behaviour intention after RoadSense score'.

2.5 Analysis

A *t*-test was applied to compare the scores on the behaviour and opinion scales before and after RoadSense. For the analysis of the individual items within the scales, and for the

effects of the course on different subgroups, ANOVA with repeated measures was applied.

In social sciences, two measures are relevant for interpreting the effect. The first is that of statistical significance that indicates the likelihood of a difference between the pre- and post-test being a result of pure chance. In this study significance level was set at $p < .05$, meaning a less than 5% chance that differences are a result of chance.

The second measure is that of effect size, indicating the magnitude of the effect. As a measure for effect size partial eta squared (η_p^2) was considered with $\eta_p^2 = .01$ as a small, $\eta_p^2 = .06$ as a medium, and $\eta_p^2 = .14$ as a large effect size (Cohen, 1988). We report the effects in five categories: These categories are presented in *Table 2.2*:

Effect size	Symbol	Interpretation
$\eta_p^2 \geq .14$	++	very strong positive effect
$\eta_p^2 < .14$ and $\eta_p^2 \geq .06$	+	strong positive effect
$\eta_p^2 < .06$ and $\eta_p^2 \geq .01$	□	positive effect
No significant effect	-	no effect
Significant effect in opposite direction	--	negative effect

Table 2.2: Effect categories: effect size, symbols, and interpretation.

2.6 Intervention

RoadSense is a programme developed by Mercedes-Benz to raise risk awareness among youngsters aged 13-16 by means of practical exercises. The programme has already been applied in several countries (e.g. England, Germany). In those countries, the programme's main objective is to prepare pre-

licence youngsters for their role as drivers. The objective of the Dutch version differs in that it aims to reduce the risks of young passengers by stimulating skill development that helps them to understand their own responsibilities, and by stimulating active coping strategies by means of group discussions. The programme offers practical exercises, such as driving on a test track, as well as group discussions.

3 Results

3.1 Prevalence and predictors

How often do youngsters in this age group expose themselves to risky conditions? Do they know how to cope with these conditions?

3.1.1 Risk behaviour

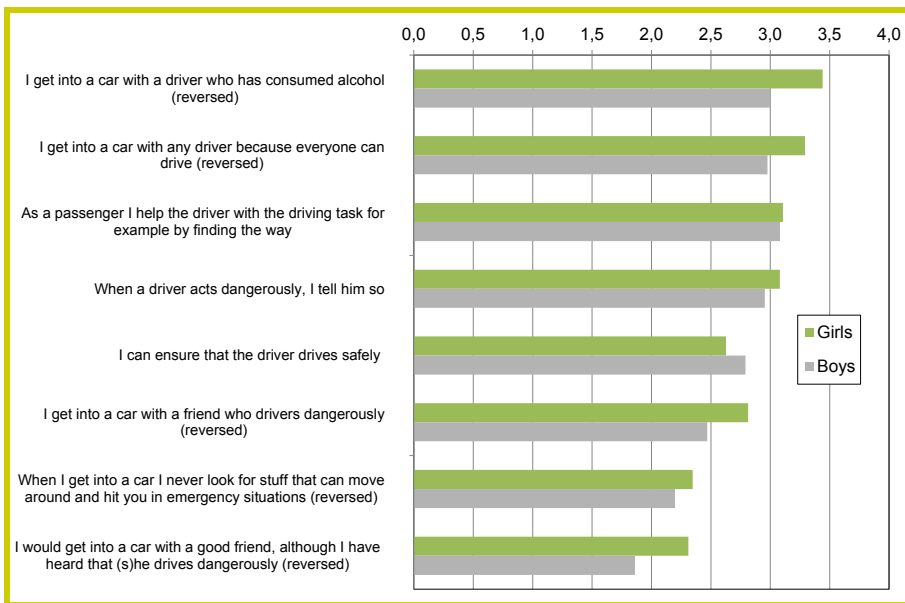


Figure 3.1: Self reported behaviour of passengers by gender on pre-test. High scores mean safe behaviour. Min=1, Max=4.

Figure 3.1 shows self-reported behaviour of the participants before the start of the programme. In general, most youngsters are careful in their actions and in the acceptance of rides. They are particularly careful with accepting rides from a driver who has consumed alcohol. Youngsters become less careful and more trusting if a driver is a friend. A *t*-test on the mean scores of item 1 (accepting a ride from a person who drives dangerously) and item 10 (accepting a ride from a friend who drives dangerously) shows this difference to be statistically significant ($t(158) = -9.31, p < .001$). The participants do not check a car for objects that can pose a danger in an emergency. In general, boys are more careless in their actions than girls are. The significant gender differences are found on items concerning accepting a ride from a good friend or a person or who drives dangerously, getting in the car with any driver (because everyone can drive) and getting in the car with a driver who has consumed alcohol (respectively $t_1(159) = 3.56, t_2(159) = 2.45, t_3(159) = 2.54, t_4(159) = 3.37, p_{1-4} < .05$).

3.1.2 Opinions

Figure 3.2 presents the scores on opinions of the participants before the start of the RoadSense programme. Young passengers do not hold clearly negative safety opinions, and there is not a lot of variation between the items. The significant gender differences appear on items such as 'handing the driver a mobile phone', 'considering violations of traffic rules as cool', 'passengers making fun' and 'not being cool asking a

driver to be more careful'. Girls score higher on these items than boys. One item stands out: the *high* trust of young passengers in the driver, and the responsibility they assign to this driver for a safe ride.

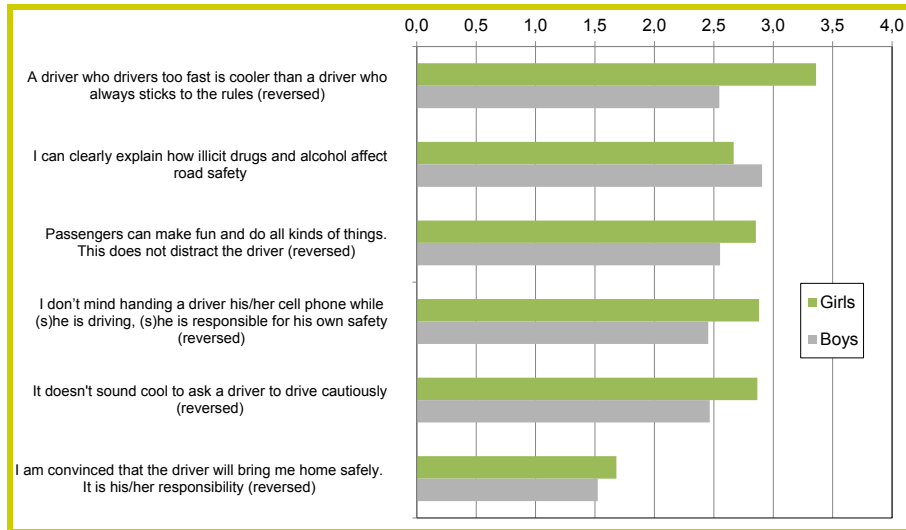


Figure 3.2: *Opinions of passengers by gender on pre-test. High scores mean safe opinions. Min =1, Max=4.*

3.1.3 Predictors of risky behaviour and opinions

Youngsters differ on how they behave as passengers and on how they think about risks. What predicts risky behaviour and risky opinions? To study this relationship, a multiple regression analysis was carried out with gender, age, school type and exposure to risk (riding with driver who has been drinking, with parents or friends who speed) as predictors.

The analyses showed that for the prediction of risky behaviour, gender was the strongest predictor, explaining 7.6% of the variance. An additional 7% of the variance was explained by exposure to risky driving, namely 'having travelled as a passenger of a driver who had been drinking'. Other variables, such as age and school type, did not improve the predictions.

What predicts unsafe opinions? A multiple regression showed a strong effect of gender, explaining 12.4% of the variance in risky opinions. Other variables, such as exposure to risk, age or school type did not improve the predictions.

3.2 Effects of RoadSense

The analyses of the effects have focussed on three research questions.

- How large is the effect on behavioural intentions and opinions? This provides an overall analysis of the impact of the programme.
- On which items do participants improve? This gives a more detailed view of which items have actually changed.
- Have all subgroups indeed improved? This shows whether the course has a weaker or a stronger effect given the profile of a participant. Ideally a course like RoadSense should have the strongest effect on the groups that are most at risk.

3.2.1 Overall effect behavioural intentions and opinions

For this analysis, the scores on all items with regard to behavioural intentions and the scores on all items with regard to opinions were totalled. This resulted in four scores for each

individual: a) pre-test behaviour, b) post-test behavioural intention c), pre-test opinions, and d) post-test opinions. *Figure 3.3* presents the mean scores for the pre- and post-test on the sum of the behaviour items. Compared to the pre-test the average post-test score improved with a quarter point. This improvement is significant with a 'large effect size' (++), $t(156) = -6,72; p < .001; r = .53$.

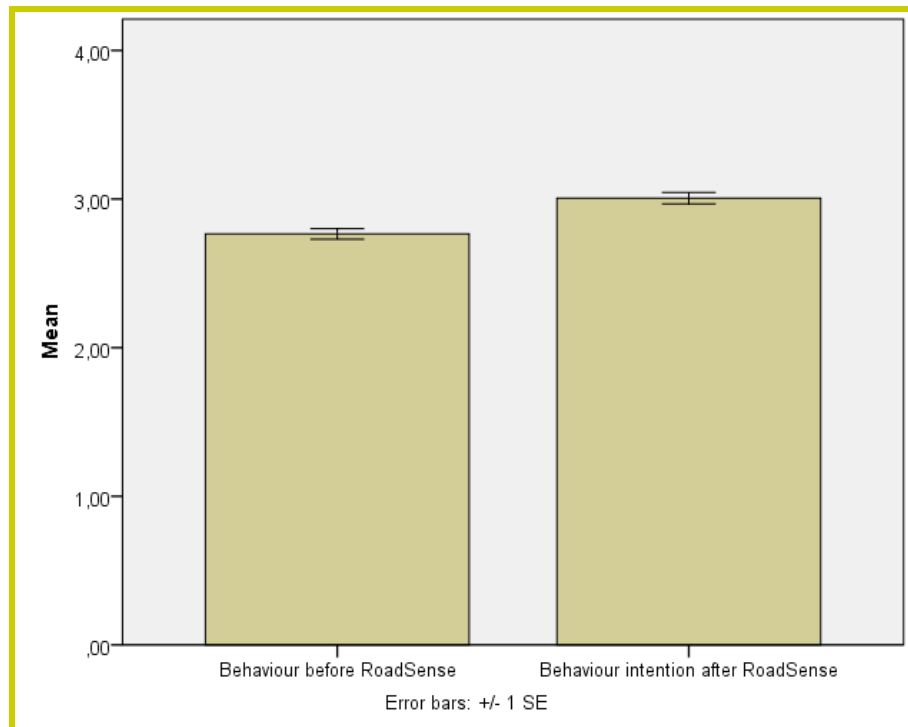


Figure 3.3: Effect of RoadSense mean scores of behaviour on intention.

RoadSense also improved opinions (see *Figure 3.4*). Compared to the pre-test score the post-test score improved with about 0.4 point. This is significant with a large effect size (++), $t(1) = -9.31; p < .001; r = .53$.

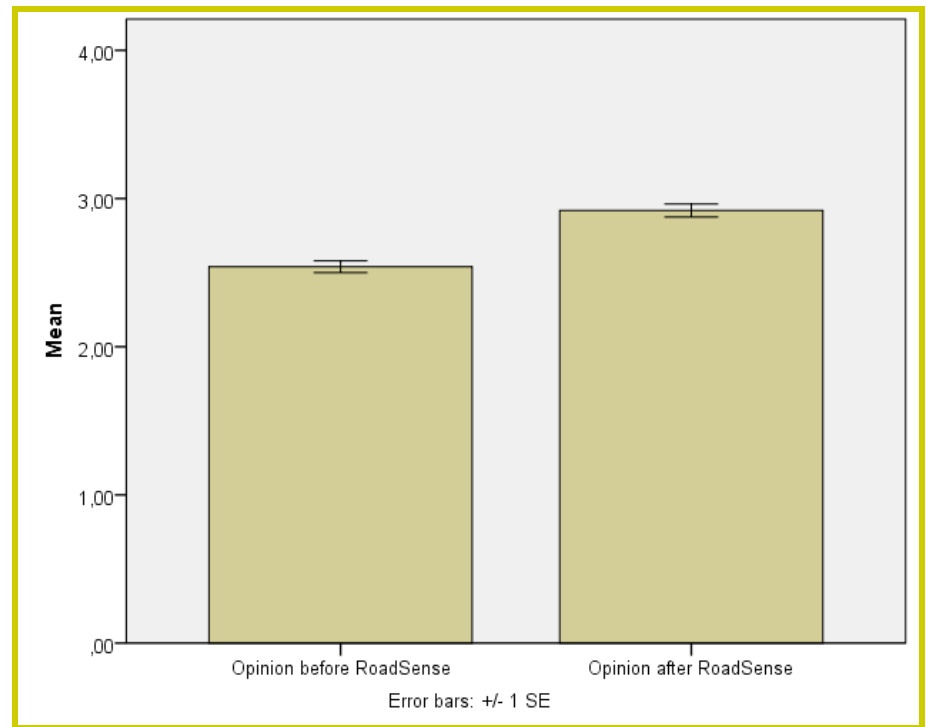


Figure 3.4: Effect of RoadSense on mean scores of opinions.

3.2.2 Effects per item

Behavioural intention

To understand on which items the participants improved, ANOVA's were carried out with repeated measures. The results are presented in *Table 3.1*. The table shows positive effects on five out of eight intentions. A square and pluses indicate a positive safety effect.

Behaviour intention	Effect of RoadSense
1. I would get into a car with a good friend, although I have heard that (s)he drives dangerously	++
2. I can ensure that the driver drives safely	++
4. I get into a car with any driver because everyone can drive	-
7. As a passenger I help the driver with the driving task for example by finding the way	□
9. When I get into a car I never look for stuff that can move around and hit you in emergency situations.	++
10. I get into a car with a friend who drives dangerously	□
11. I get into a car with a driver who has consumed alcohol	-
13. When a driver acts dangerously, I tell him/her so	-

Table 3.1: Items and effect size for behavioural intention. See for the meaning of the symbols *Table 2.2*.

Reason for concern is the small effect of RoadSense on the intention to travel with any driver (item 4), the intention to tell the driver that (s)he is acting dangerously (item 13) and the intention to travel with a driver who has been drinking (item

11). Participants did not improve significantly on these items after completion of RoadSense.

Opinions

Table 3.2 presents the effects on opinions. Four out of six items show a positive effect of the course. The effect sizes are moderate, except for one strong positive effect on the item concerning having responsibility as a passenger for a safe trip home (item 3). However, on two of the six items the improvement was not significant: the opinion about whether or not a driver who drives too fast is cool (item 6), and the opinion about the effects of illicit drugs and alcohol (item 8) did not significantly improve.

Opinions	Effect of RoadSense
3. I am convinced that the driver will bring me home safely. It is his/her responsibility	++
5. I don't mind handing a driver his/her cell phone while (s)he is driving, (s)he is responsible for his/her own safety	+
6. A driver who drives too fast is cooler than a driver who always sticks to the rules of the road	-
8. I can clearly explain how illicit drugs and alcohol affect road safety	-
12. Passengers can make fun and do all kinds of things. This does not distract the driver	□
14. It doesn't sound cool to ask a driver to drive cautiously	□

Table 3.2: Items and effect sizes for opinions. See for the meaning of the symbols *Table 2.2*.

3.3 The influence of background variables on effects of RoadSense

Participants differed in background variables, such as gender, age, exposure to risky driving, and school type. To study whether RoadSense had a different effect on youngsters from different backgrounds, ANOVA's were carried out, with a background variable as a between subject variable, and pre- and post-test (time) as a within subjects variable. A main effect of the background variable indicates that these groups differ both on the pre- and the post-test. A main effect of time indicates that the pre-test and post-test scores differ, which shows that RoadSense had an effect. An interaction between group and time indicates that the effects of RoadSense differ by group. The latter interaction is of interest for the influence of background variables on the effects of the intervention.

3.3.1 Behaviour and opinion scales

The course had a positive effect for both school types (see *Figure 3.5*) and for both sexes (see *Figure 3.6* en *3.7*). However, girls improved more than boys, and youngsters in the theoretical secondary education (havo and vwo) improved more than youngsters in vocational training. Also the passenger who had been riding with a speeding parent benefitted, but this effect was only found on opinions (see *Figure 3.8*). No differences existed among the other groups (exposed to risky driving because of alcohol, careless drivers or age groups).

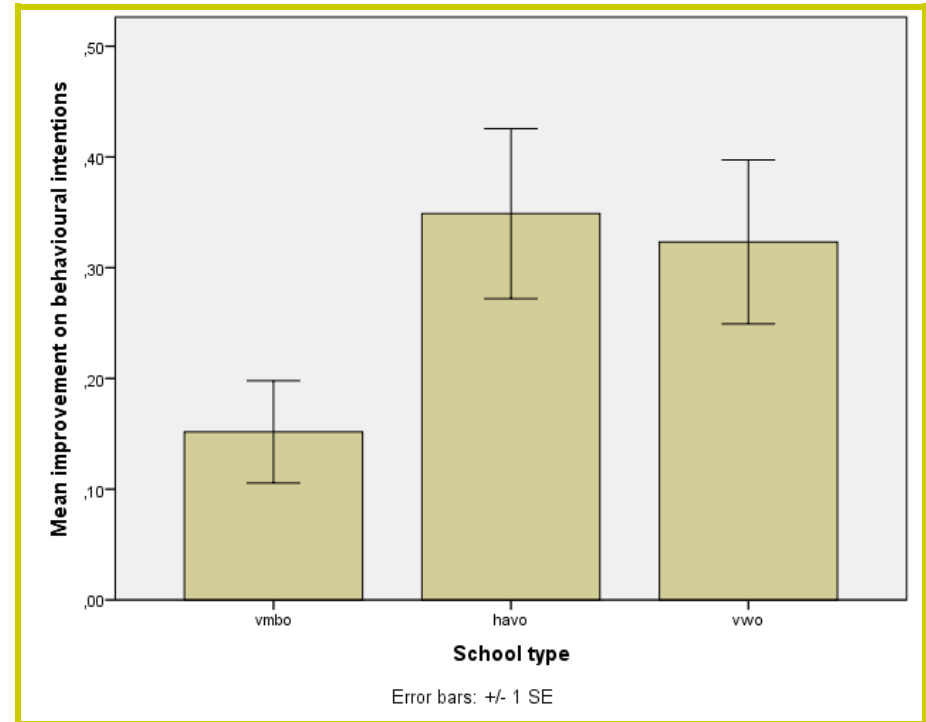


Figure 3.5: Effect of RoadSense by school type (vmbo= schools for vocational training; havo & vwo= schools for theoretical secondary education).

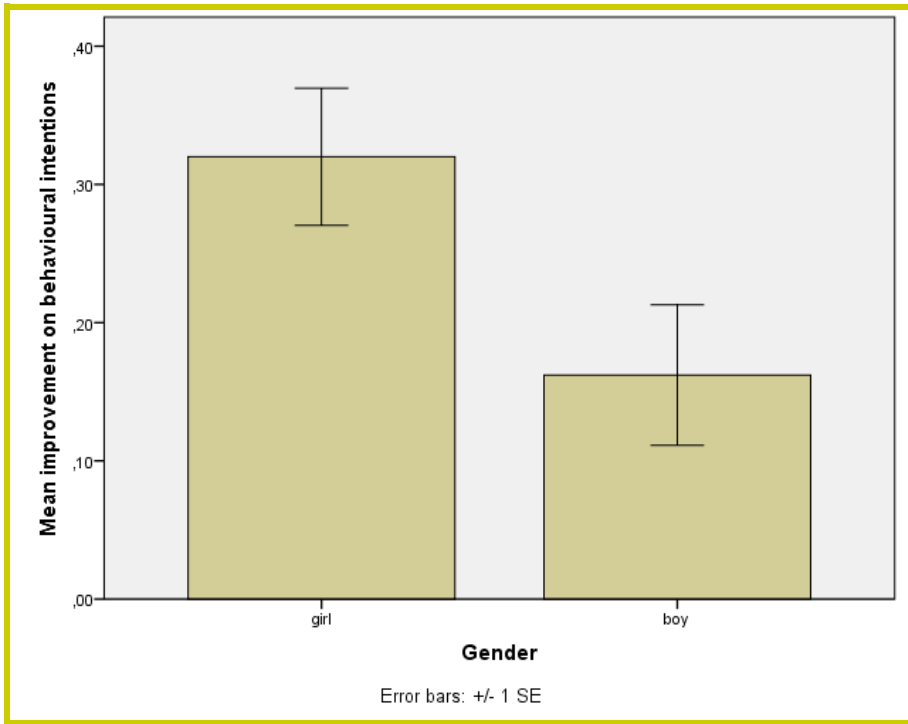


Figure 3.6: Effect of RoadSense on behavioural intentions by gender.

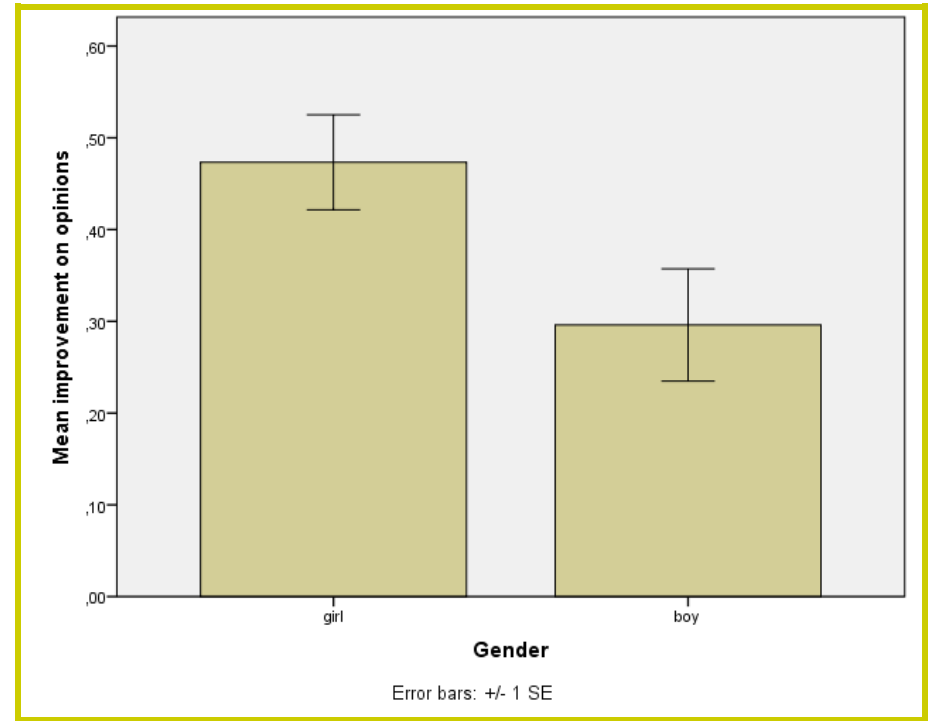


Figure 3.7: Effect of RoadSense on opinions by gender.

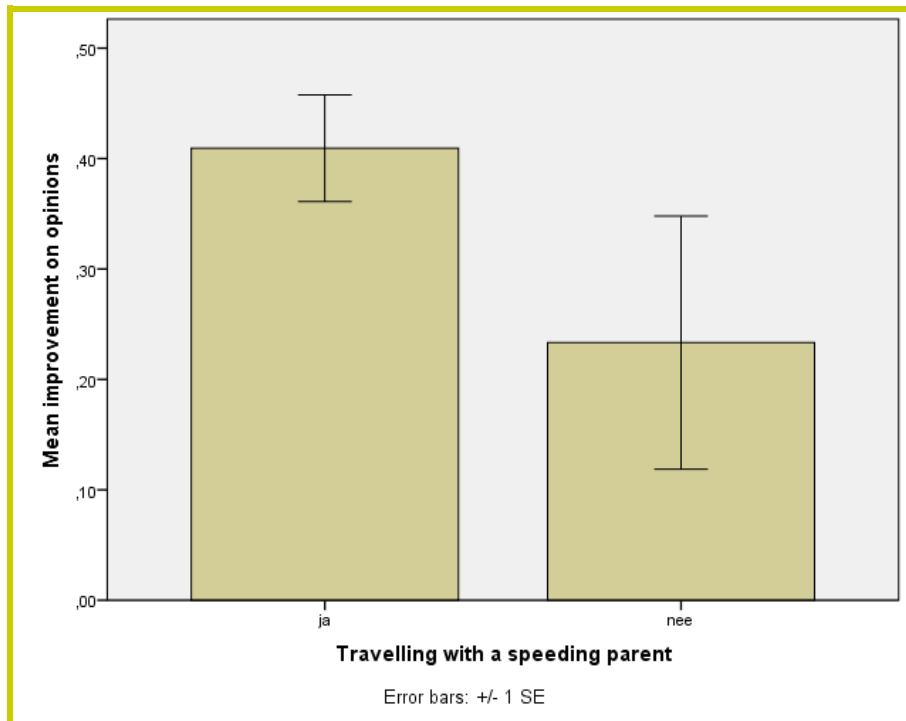


Figure 3.8: Effect of RoadSense by exposure to a speeding parent.

3.3.2 Per item

The analyses per item should be treated with caution as the data did not meet the requirement for ANOVA of being normally distributed.

Gender

With the exception of only two items ('I can ensure that the driver drives safely' and 'I can clearly explain how illicit drugs and alcohol affect road safety') boys report more safety compromising behaviours on the pre-test (Figure 3.1) and opinions (Figure 3.2) than girls do. Further analyses of the differences between the pre- and post-test scores show interactions between time and gender on four items, (indicating that RoadSense is *not* equally effective for boys as for girls). The course was more beneficial for girls on the items: 'As a passenger I help the driver with the driving task, for example by finding the way', 'I can clearly explain how illicit drugs and alcohol affect road safety', 'Passengers can make fun and do all kinds of things. This does not distract the driver' and 'When the driver acts dangerously, I tell him so'.

Previous exposure

Table 3.3 shows the differences in risky behaviours grouped by previous exposure to risky driving (speeding parents and friends, and drinking drivers). Only items that showed statistically significant main effects of group, indicating that the groups differed, are included in the table. The label 'Risk' is used to indicate a main effect of group whereby the exposed group is more at risk than the non-exposed group. On only two out of fourteen items the exposed passengers reported more risky behaviour and opinion than the unexposed passengers.

Items (behaviour and opinions)	Exposure		
	Speeding parents	Speeding friends	Drunk driver
I get into a car with a friend who drives dangerously	No	No	Risk
It doesn't sound cool to ask a driver to drive cautiously	No*	No	Risk

Table 3.3: Items for which exposure to risk was associated with exposed youngsters responding in a more dangerous direction than non-exposed youngsters (Risk).

* A group exposed to speeding parents showed more cautious opinion.

The interaction between time and group was found statistically significant on four items (see Table 3.4). On three items RoadSense had a larger effect on the exposed group than on the non-exposed group. On one item the opposite effect has been found.

Items (behaviour and opinions)	Exposure		
	Speeding parents	Speeding friends	Drunk driver
I get into a car with any driver because everyone can drive	non-exposed > exposed	No	No
A driver who drives too fast is cooler than a driver who always sticks to the rules of the road	exposed > non-exposed	No	No
I can clearly explain how illicit drugs and alcohol affect road safety	exposed > non-exposed	No	No
I get into a car with a friend who drives dangerously	exposed > non-exposed	exposed > non-exposed	No

Table 3.4: Items for which the interaction effects have been found.

School type and age

School type and age did make a difference on a number of items (see Table 3.5). Compared to the youngsters in vocational training, the ones in theoretical training were more safety oriented and benefitted more from the course. Older participants were more safety oriented than the younger ones on two items. The course did not have an extra effect on the younger age groups.

Items (Behaviour and opinions)	Theoretical less risky/ extra effect	Older less risky/ extra effect
I can ensure that the driver drives safely		Yes ^c
I am convinced that the driver will bring me home safely. It is his/her responsibility	No ^b /Yes ^a	
I don't mind to hand the driver his cell phone while he is driving, he is responsible for his own safety	No ^b /Yes ^a	
A driver who drives too fast is cooler than a driver who always sticks to the rules of the road	Yes ^b /No ^a	
As a passenger I help the driver with the driving task, e.g. by helping him/her to find the way	Yes ^b /No ^a	
When I enter a car, I never look for stuff that can move and hit you in emergency situations		Yes ^c
I travel with a driver who has consumed alcohol	Yes ^b /No ^a	
Passengers can make fun and do all kinds of things. This does not distract the driver	No ^b /Yes ^a	
When a driver acts dangerously, I tell him so	No ^b /Yes ^a	
It doesn't sound cool to ask a driver to drive cautiously	No ^b /Yes ^a	

Table 3.5: Items for which effects of school type and age have been found.

^a Interaction effects: course is more effective for theoretical students than for vocational students. ^b Main effect: theoretical students respond more safety minded on both the pre- and post-test than vocational students.

^c Main effect: Older students respond more safely minded on both the pre-test and post-test than younger students.

4 Discussion

4.1 *Conclusions and implications*

This study had three objectives: a) to gather information about the behaviour of young Frysian passengers, their exposure to risky driving, and their opinions about these risks; b) to assess the effects of the RoadSense programme on the behavioural intention of the young passengers and on their opinions; and c) to study the role of background variables such as age, gender, school type, and previous exposure to risky driving, in relation to the effects of RoadSense.

4.1.1 *Are passengers at risk?*

The results show that young passengers are indeed exposed to risky driving. Those participants that have been exposed to rides with drinking drivers, also hold more safety-compromising opinions and report more risky behaviour themselves. In general, boys behave more risky than girls do, and also hold more safety compromising attitudes. Youngsters who attend theoretical secondary schools (havo, vwo) have been found to be more safety oriented than students attending vocational secondary schools. Other subgroups (age, exposure to speeding) did not show differences.

Therefore, gender and school type are the most important predictors of risk behaviour and risky opinions. This gender difference is in line with earlier studies. For instance, a meta-analysis on gender differences and risks in many different

fields, shows males to be overrepresented in any possible risk behaviour (Byrnes, Miller & Schafer, 1999).

The question that cannot be answered on the basis of this study and which requires further study, is whether the exposure to risky driving is causing these safety compromising behaviours and opinions, or vice versa, that the risky opinions lead to youngsters seeking exposure to risky driving.

The results further indicate that coping skills are probably underdeveloped. Youngsters appear to have problems with speaking up, and correcting drivers. A further indication of the complexities involved is the fact that youngsters are cautious in accepting rides, but if the driver is a friend they still get in, even if they consider him to be a dangerous driver. Also they put a lot of trust in the competencies of drivers, and believe that only the driver is responsible for a safe trip.

Except for these issues, the study shows Frysian adolescents to be cautious and conscious of the risks involved. This raises the question whether an intervention that targets adolescent passengers is actually needed. Still, there are at least four reasons to support such an intervention. First of all, the purpose of an intervention is not only to change behaviour but also to protect the positive attitudes and to reinforce safe behaviour (Glanz, Rimer & Lewis, 2002). Secondly, peer group pressure is a strong influence, and an intervention may strengthen the norm of

'good' behaviour, especially if the intervention takes peer group influences into account. An example of such an influence of social norms among Dutch adolescents is the rejection of drink-driving (Vlakveld, 2005). Thirdly, young adolescents are impulsive, and may easily go with the flow, almost unaware of the possible negative consequences of their actions (Arnett, 1992; Casey, Getz & Galvan, 2008). An intervention may prepare youngsters for such conditions and stimulate the development of protective skills. A fourth reason is that adolescents strive for new experiences, new environments and enjoy making new friends. These novel situations may also be novel in terms of the risks they may encounter. Early interventions, before the risk actually arises, may help them to cope with risks.

Thus, interventions directed at empowering youngsters to protect themselves against those risks may contribute significantly towards their safety.

4.1.2 Effects of RoadSense

The evaluation was conducted as a simple self-reported study, comparing scores on a pre- and post-test questionnaire, without a control group. The results show that the programme had an immediate effect. After the intervention, participants expressed intentions to behave more safely than they had done in the past. The programme also had a positive influence on most of the opinions with regard to road safety. Long-term effects and effects on actual behaviour were not studied.

4.1.3 The influence on background variables

Exposure

The course had an extra effect on the opinions of youngsters who had been exposed to the risk of riding with a speeding parent. They improved more than youngsters who had not been exposed. In contrast, the course did not have an extra effect on youngsters exposed to drunk drivers. The present study was not sufficiently detailed to be able to explain this differential effect. A possible explanation could be the finding that the participants already held clearly negative safety opinions about drink-driving before the onset of the course and thus did not improve during the course. It seems that youngsters already conform to a social norm that rejects drunk-driving. Such a norm does not exist for speeding. The sheer magnitude of speed violations among Dutch drivers makes it almost impossible to get the message across that speeding is a killer, especially among novice drivers.

Age and gender

The results show a consistent effect of higher risks for boys than for girls on the pre-test and the post-test. The course was somewhat more beneficial for girls than for boys. Thus, the course did 'something extra' for girls. The programme's impact would increase, if it were to invest in the development of elements that are especially effective for this high-risk group.

In contrast to gender, age was not a strong predictor for risk behaviour and risky opinions. The effects of the course did not differ between the age groups.

School type

Youngsters attending theoretical secondary schools benefitted more from the course than those attending vocational secondary schools. This raises the question whether RoadSense was sufficiently adapted to the needs and characteristics of these participants.

4.2 Limitations of the study

The present study used short questionnaires to gather information on risky behaviours and opinions, and to assess the immediate effect of the intervention. This methodology has its limitations.

First, any intervention aiming to improve road safety should not only improve intentions and opinions, but should also improve actual behaviour. Although the literature has shown that changes in behavioural intentions also result in changes in behaviour, the actual strength of the relationship is rather weak (Webb & Sheeran, 2006).

Related to this issue is the duration of the change. The present study only looked at the immediate effect, whereas road safety interventions, in order to be effective, should have a long(er) term effect.

The third limitation is that of the self-report method. This method does not exclude the possibility that response biases may be responsible for the observed differences between groups. For instance, the difference between boys and girls may be a result from their perspectives on 'social desirability'. For instance, to be 'real men' boys are expected to be risk-takers, whereas 'real girls' are expected to be risk-avoiders.

Finally, the absence of a control group also weakens the reliability of the results. The intervention may just have been

effective because of the setting of doing something new and exciting and not so much because of the content of the programme.

The present study shows promising changes in intentions and opinions resulting from the RoadSense programme. To assess the effects on road safety, however, a 'proper' evaluation study is required, studying long-term effects (e.g. after three months) on (self-reported) behaviour. To control for external influences, such a study should also include a control group.

4.3 Recommendations

Target group

- The focus on passengers is relevant. Learn more about the context of risky decision-making and the relevant coping skills.
- Communicate these findings to raise awareness, and to illustrate the necessity of interventions such as RoadSense.

Programme development

- Pay more attention to elements effective for young males and students of vocational secondary education.
- Differentiate the groups with respect to their previous exposure to risky driving, especially riding with a speeding parent.
- Include a topic on safety, friends, loyalty, peer pressure and coping skills.

- Raise awareness among parents about the relationship between exposure to risky driving, and risky behaviours and attitudes.

Evaluation

- Study the long-term effects on behaviour.
- Include a control group.
- Validate the measurement instrument, so that answers really reflect behaviours and opinions, without interferences from social desirability.

4.4 Conclusions

The present study illustrates the vulnerability, and inexperience of Frysian young adolescents in their role of car passengers.

RoadSense aims to raise risk awareness and to improve their coping skills. The results show the programme to raise awareness and to improve behavioural intentions, when measured immediately after the course. The programme's impact could be strengthened if it had a greater influence on high-risk groups such as young males. Furthermore, two themes could be explored further: the role of 'friends and group pressure', and the influence parents have on the behaviours and opinions of their teens. The question, whether the programme improves safety, can only be answered on the basis of a study on the long-term effects on behaviour in which external influences are controlled for by the inclusion of a control group.

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Uitspraken over autorijden

Hieronder zie je uitspraken over autorijden. Lees elke uitspraak en kijk of je het met de uitspraak eens bent. Omcirkel de '4' als je het helemaal eens bent met de uitspraak en omcirkel de '1' als je het er juist helemaal *niet* mee eens bent.

		Klopt helemaal	Klopt een beetje	Klopt niet	Klopt helemaal niet
1	Ik stap wel bij een goede vriend in de auto, ook al heb ik gehoord dat hij gevaarlijk rijdt.	4	3	2	1
2	Ik kan ervoor zorgen dat een bestuurder veilig rijdt.	4	3	2	1
3	Ik vertrouw volledig op de bestuurder dat we veilig thuiskomen. Het is zijn/ haar verantwoordelijkheid.	4	3	2	1
4	Ik stap bij iedereen in de auto, autorijden kan toch iedereen...	4	3	2	1
5	Ik vind het geen probleem de bestuurder zijn mobiel te geven tijdens het rijden, hij is zelf verantwoordelijk voor zijn veiligheid.	4	3	2	1
6	Een bestuurder die te hard rijdt, vind ik stoerder dan een bestuurder die altijd de regels volgt.	4	3	2	1
7	Wanneer ik meerrijd als passagier help ik de bestuurder door bijvoorbeeld de weg te vinden.	4	3	2	1
8	Ik kan goed uitleggen hoe drugs en alcohol de verkeersveiligheid beïnvloeden.	4	3	2	1
9	Ik let er nooit op waar spullen in de auto liggen.	4	3	2	1
10	Ik stap in een auto bij vrienden die onveilig rijden.	4	3	2	1
11	Ik stap in de auto bij een bestuurder die gedronken heeft.	4	3	2	1
12	Passagiers moeten gewoon lekker kenen. Daar heeft de bestuurder geen last van.	4	3	2	1
13	Als de bestuurder zich gevaarlijk gedraagt, zeg ik daar iets van.	4	3	2	1
14	Het komt suf over om de bestuurder te vragen voorzichtig te rijden.	4	3	2	1

Wat heb jij meegemaakt?

Als passagier maak je van alles mee. Wat is jou overkomen? Denk aan de laatste 4 weken. Omcirkel het juiste antwoord, of vul de stippellijntjes in.

			Ja	Nee
12.a	Heb je bij iemand in de auto gezeten die te hard reed?		Ja	Nee
12 b	Zo ja, wie was dat?	<ul style="list-style-type: none"> • Eén van je ouders? 	Ja	Nee
		<ul style="list-style-type: none"> • Eén van je vrienden? 	Ja	Nee
		<ul style="list-style-type: none"> • Iemand anders, n.l. 	
12.c	Heb je daar toen iets van gezegd?		Ja	Nee
13.a	Heb je bij iemand in de auto gezeten die teveel alcohol had gedronken?		Ja	Nee
13.b	Zo ja, wie was dat?	<ul style="list-style-type: none"> • Eén van je ouders? 	Ja	Nee
		<ul style="list-style-type: none"> • Eén van je vrienden? 	Ja	Nee
		<ul style="list-style-type: none"> • Iemand anders, n.l. 	
13.c	Heb je daar toen iets van gezegd?		Ja	Nee
14.a	Heb je weleens bij iemand in de auto gezeten die zo gevaarlijk reed, dat je je niet meer veilig voelde?		Ja	Nee
14.b.	Zo ja, wie was dat?	<ul style="list-style-type: none"> • Eén van je ouders? 	Ja	Nee
		<ul style="list-style-type: none"> • Eén van je vrienden? 	Ja	Nee
		<ul style="list-style-type: none"> • Iemand anders, n.l. 	
14.c	Heb je daar toen iets van gezegd?		Ja	Nee

Tot slot graag nog even de volgende gegevens van jou:

Geslacht	<input type="checkbox"/> man	<input type="checkbox"/> vrouw
Leeftijd	<input type="text"/>	jaar
School		
<input type="checkbox"/> vmbo	<input type="checkbox"/> havo	
<input type="checkbox"/> ROC	<input type="checkbox"/> vwo	

Hartelijk dank voor je antwoorden en veel plezier bij RoadSense!

Uitspraken over autorijden

Lees elke uitspraak en kijk of je het met de uitspraak eens bent. Omcirkel de '4' als je het helemaal eens bent met de uitspraak en omcirkel de '1' als je het er juist helemaal *niet* mee eens bent.

		Klopt helemaal	Klopt een beetje	Klopt niet	Klopt helemaal niet
1	Ik zou wel bij een goede vriend in de auto stappen ook al heb ik gehoord dat hij gevaarlijk rijdt.	4	3	2	1
2	Ik kan ervoor zorgen dat een bestuurder veilig rijdt.	4	3	2	1
3	Als passagier is het ook mijn plicht om ervoor te zorgen dat we veilig thuiskomen.	4	3	2	1
4	Ik zou erover nadenken of ik wel bij een vriend in de auto stap, die altijd hard en gevaarlijk rijdt.	4	3	2	1
5	Ik vind het geen probleem de bestuurder zijn mobiel te geven tijdens het rijden, hij is zelf verantwoordelijk voor zijn veiligheid.	4	3	2	1
6	Een bestuurder die te hard rijdt, vind ik stoerder dan een bestuurder die altijd de regels volgt.	4	3	2	1
7	Wanneer ik meerijd als passagier ben ik van plan om de bestuurder te helpen: bijvoorbeeld door de weg te helpen vinden of spullen op te bergen.	4	3	2	1
8	Ik kan goed uitleggen hoe drugs en alcohol de verkeersveiligheid beïnvloeden.	4	3	2	1
9	Ik ga erop letten of er spullen in de auto liggen die kunnen rondslingeren.	4	3	2	1
10	Ik ben van plan in een auto te stappen met vrienden waarvan ik weet dat ze onveilig rijden.	4	3	2	1
11	Ik ben van plan in de auto te stappen bij een bestuurder die gedronken heeft.	4	3	2	1
12	Als passagier kan ik gewoon lekker keten, daar heeft de bestuurder geen last van.	4	3	2	1
13	Als de bestuurder zich gevaarlijk gedraagt, ben ik van plan daar iets van te zeggen.	4	3	2	1
14	Als ik zou vragen de bestuurder voorzichtig te rijden, komt dat suf over.	4	3	2	1

Vragen over het programma

1. Vertel in één zin wat je van RoadSense hebt geleerd:

2. Wat vond je - naast het autorijden - het leukste en waarom?

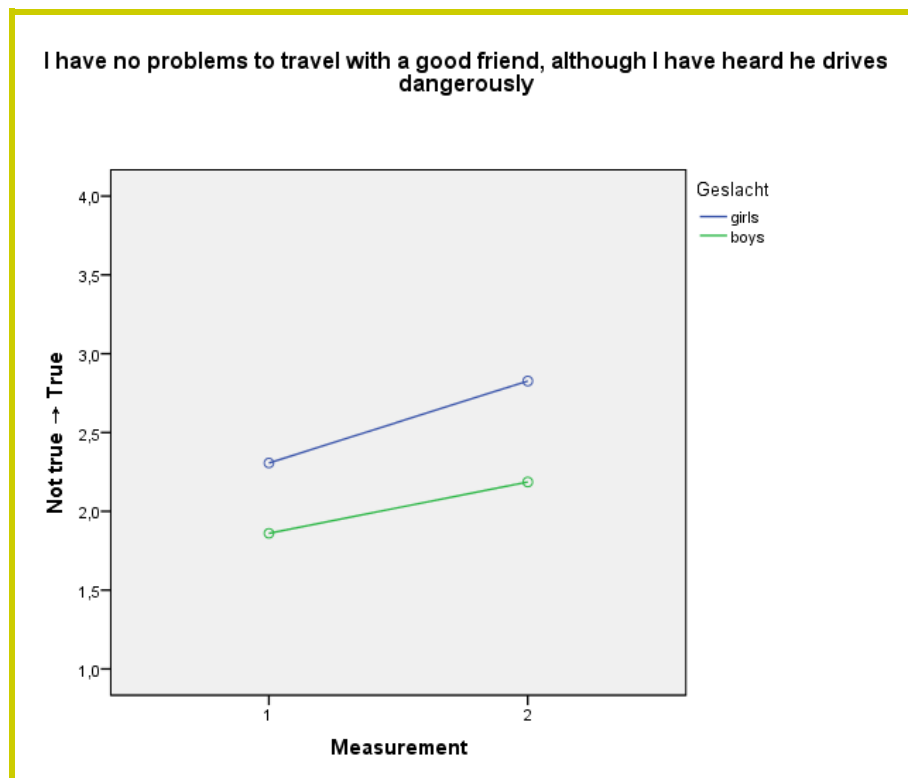
3. Zou je RoadSense ook aan andere scholieren aanbevelen?

Hartelijk dank voor je antwoorden en je deelname aan RoadSense!

Appendix 3 Detailed analyses

Responses by gender

Girls = 75
Boys = 86

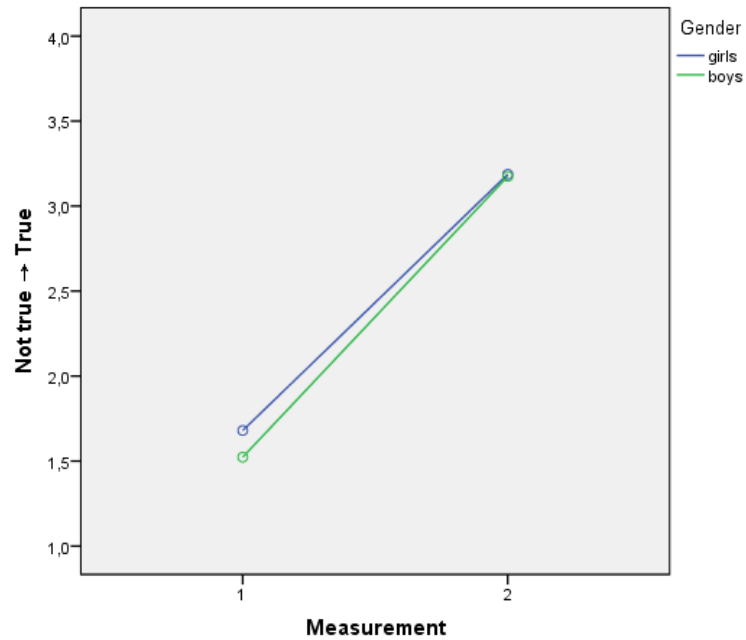


Main effect RoadSense: $F(1,159) = 38.73; p < .01; \eta_p^2 = .20$
 Main effect Gender: $F(1,159) = 23.33; p < .01; \eta_p^2 = .13$
 Interaction effect RoadSense × Gender: $F(1,159) = 2.05; p = .15$



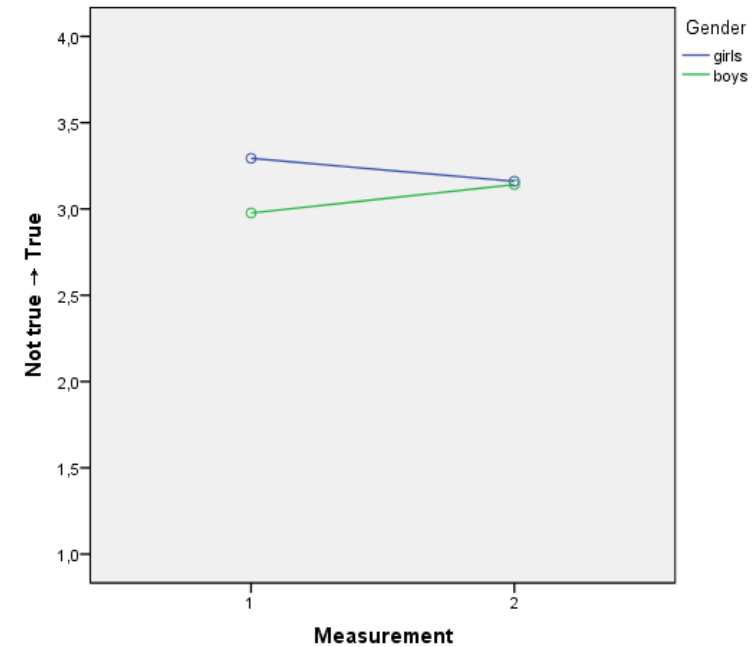
Main effect RoadSense: $F(1,159) = 50.27; p < .01; \eta_p^2 = .24$
 Main effect Gender: $F(1,159) = .66; p = .42$
 Interaction effect RoadSense × Gender: $F(1,159) = 1.7; p = .20;$

I am convinced that the driver will bring me home safely. It is his/her responsibility



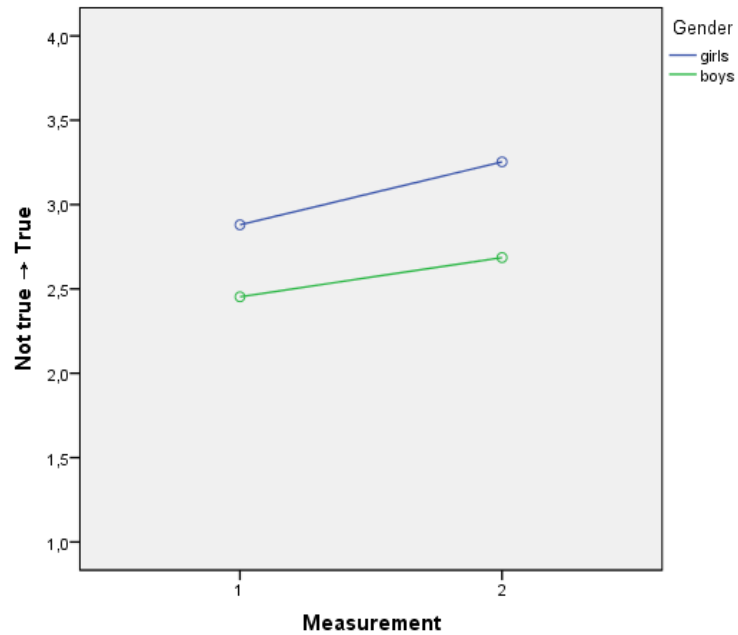
Main effect RoadSense: $F(1,159) = 364.47$; $p < .01$; $\eta_p^2 = .70$
 Main effect Gender: $F(1,159) = 1.01$; $p = .32$;
 Interaction effect RoadSense \times Gender: $F(1,159) = 0.76$; $p = .38$

I travel in any car as a passenger as everyone can drive



Main effect RoadSense: $F(1,158) = 0.03$; $p = .86$
 Main effect Gender: $F(1,158) = 3.32$; $p = .07$;
 Interaction effect RoadSense \times Gender: $F(1,158) = 3.00$; $p = .085$

I don't mind handing the driver his cell phone while he is driving, the driver is responsible for his own safety

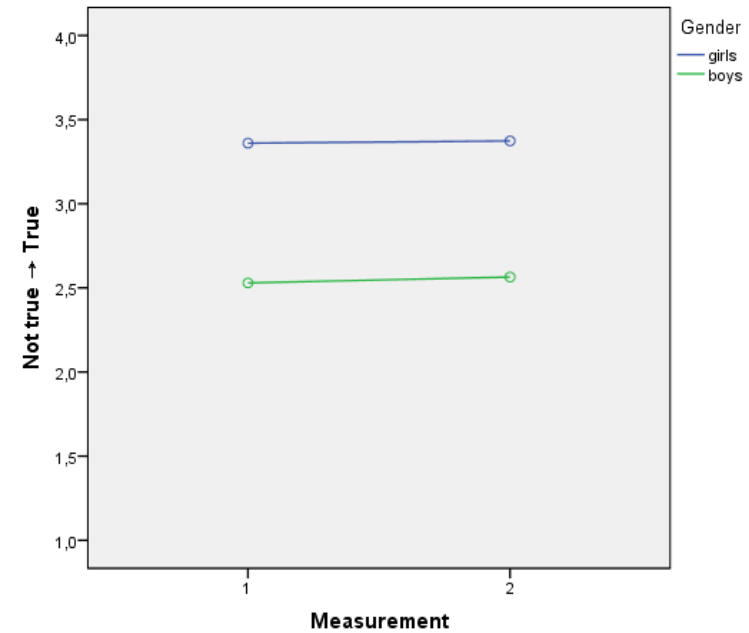


Main effect RoadSense: $F(1,159) = 19.67$; $p < .001$; $\eta_p^2 = .11$

Main effect Gender: $F(1,159) = 17.62$; $p < .001$; $\eta_p^2 = .10$

Interaction effect RoadSense \times Gender: $F(1,159) = 1.06$; $p = .30$

A driver who drives too fast is cooler than a driver who always sticks to the rules of the road

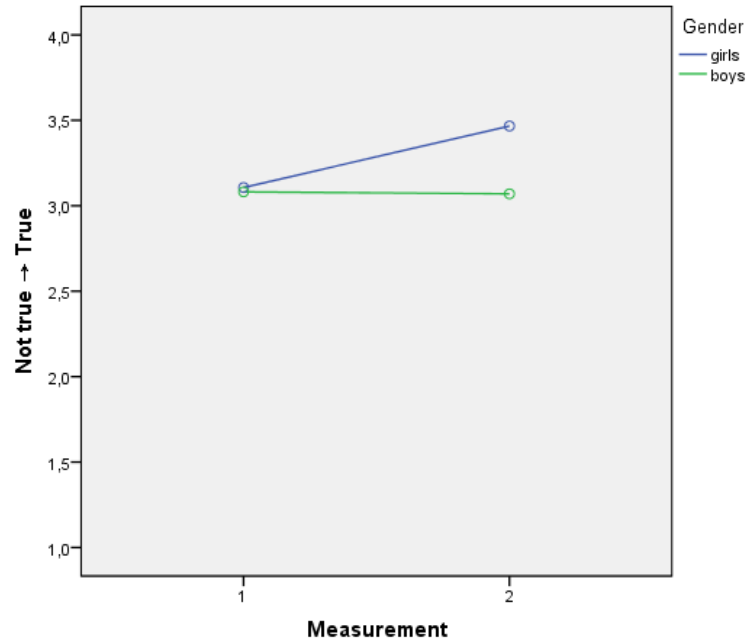


Main effect RoadSense: $F(1,158) = 0.15$; $p = .70$

Main effect Gender: $F(1,158) = 48.34$; $p < .001$; $\eta_p^2 = .23$

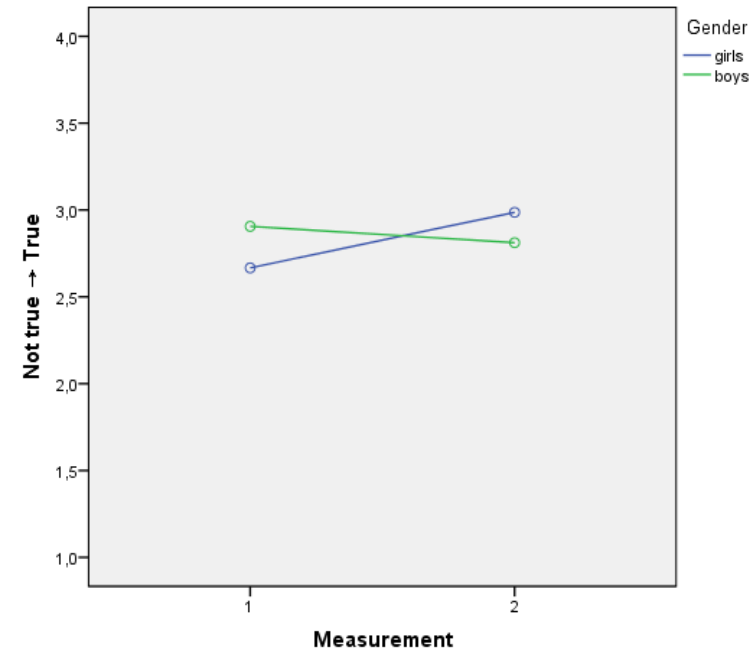
Interaction effect RoadSense \times Gender: $F(1,158) = 0.03$; $p = .86$

When travelling with a driver I help him/her with his/her driving task, for example by helping him/her to find the way



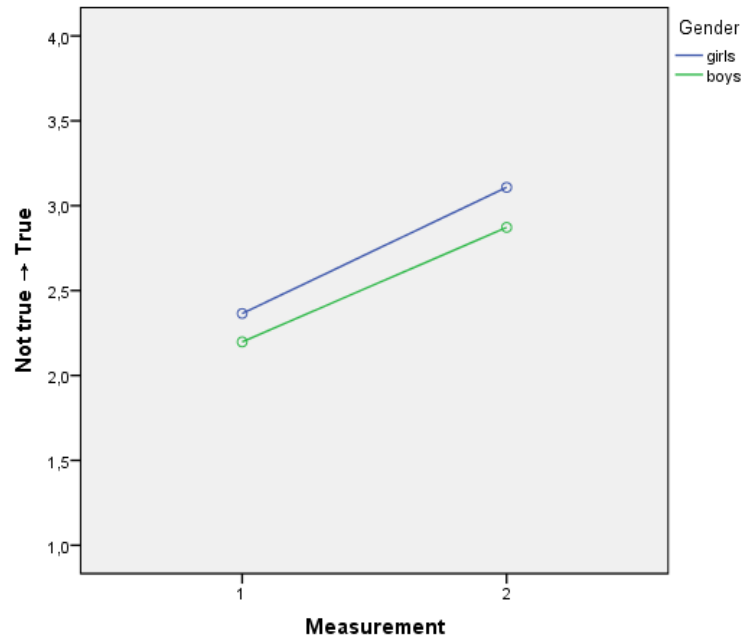
Main effect RoadSense: $F(1,159) = 6.22; p < .01; \eta_p^2 = .038$
 Main effect Gender: $F(1,159) = 5.58; p < .05; \eta_p^2 = .034$
 Interaction effect RoadSense \times Gender: $F(1,159) = 7.08; p < .01; \eta_p^2 = .043$

I can explain clearly how illicit drugs and alcohol affect road safety



Main effect RoadSense: $F(1,158) = 2.67; p = .103$;
 Main effect Gender: $F(1,158) = 0.089; p = .77$
 Interaction effect RoadSense \times Gender: $F(1,158) = 9.03; p < .05; \eta_p^2 = .05$

When I enter a car, I never look for stuff that can move and can hit you in emergency situations

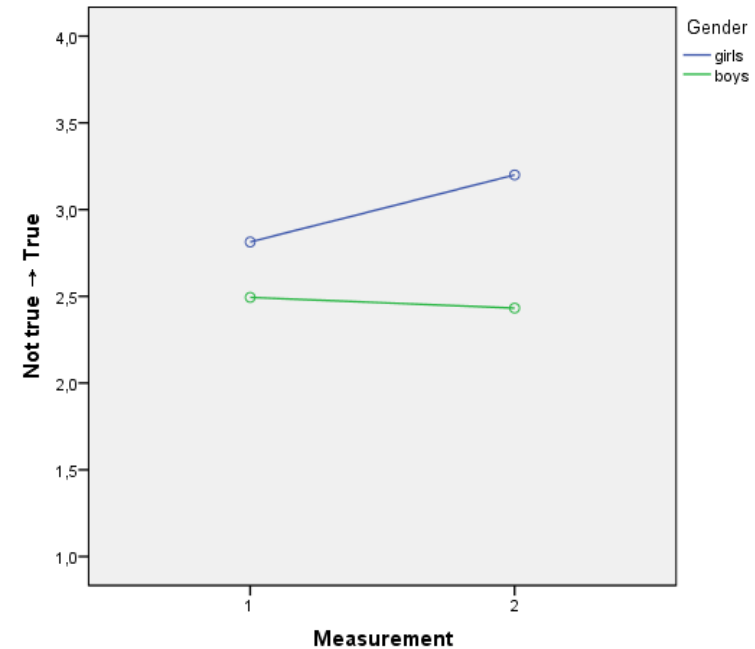


Main effect RoadSense: $F(1,158) = 56.64; p < .001; \eta_p^2 = .26$

Main effect Gender: $F(1,158) = 4.64; p < .05; \eta_p^2 = .03$

Interaction effect RoadSense × Gender: $F(1,158) = 0.13; p = .72$

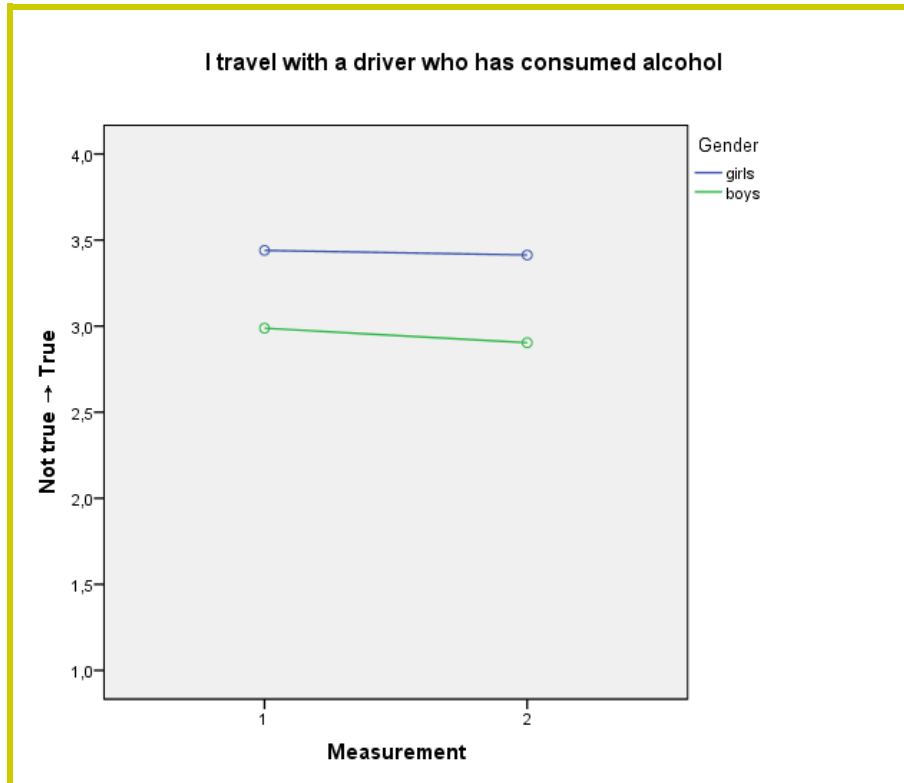
I travel with a friend who drives dangerously



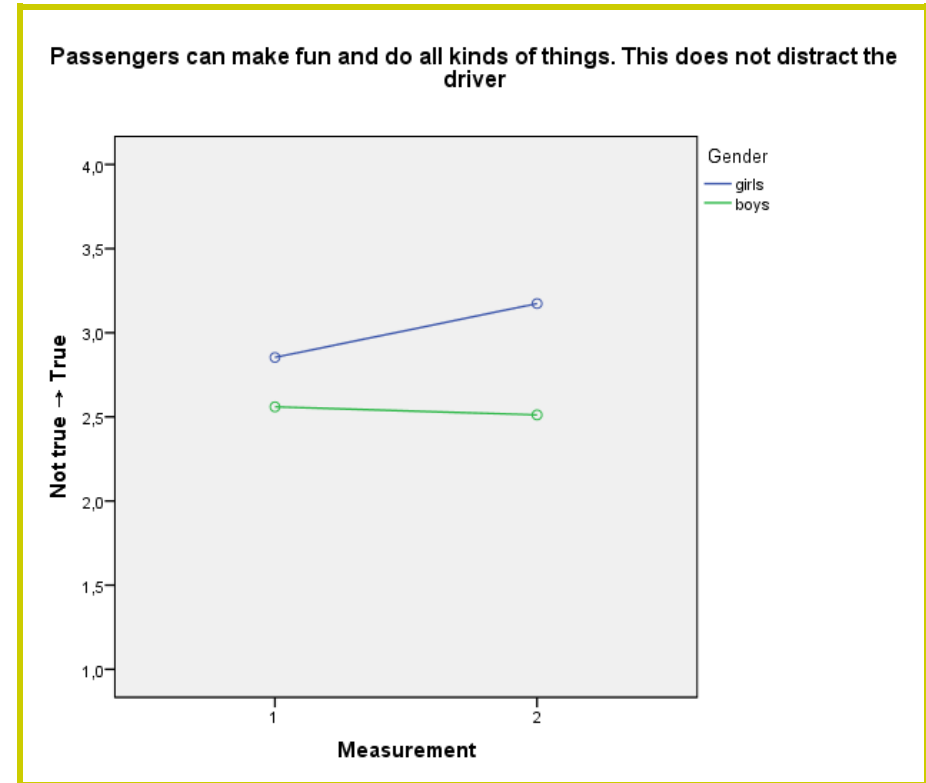
Main effect RoadSense: $F(1,154) = 5.53; p < .05; \eta_p^2 = .035$

Main effect Gender: $F(1,154) = 23.60; p < .001; \eta_p^2 = .13$

Interaction effect RoadSense × Gender: $F(1,154) = 10.53; p = .001; \eta_p^2 = .064$

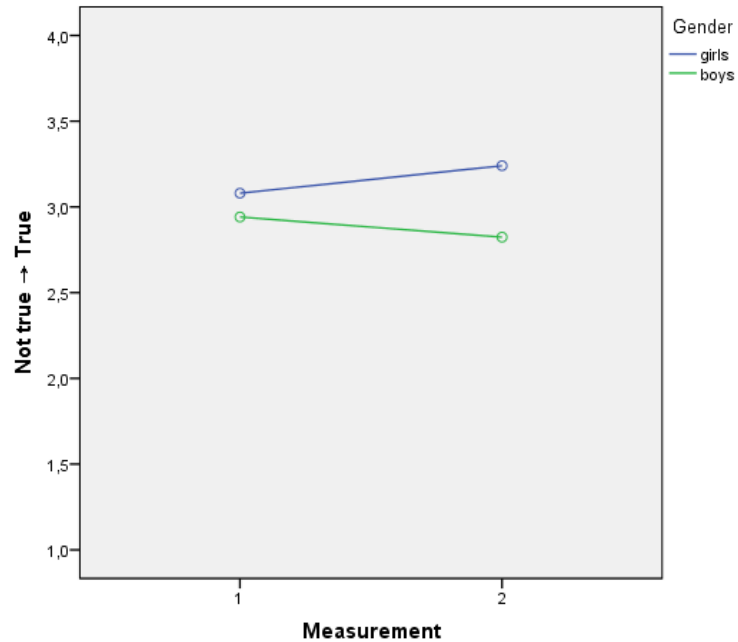


Main effect RoadSense: $F(1,156) = 0.76$; $p = .39$
 Main effect Gender: $F(1, 156) = 17.05$; $p < .001$; $\eta_p^2 = .099$
 Interaction effect RoadSense \times Gender: $F(1, 156) = 0.20$; $p = .65$



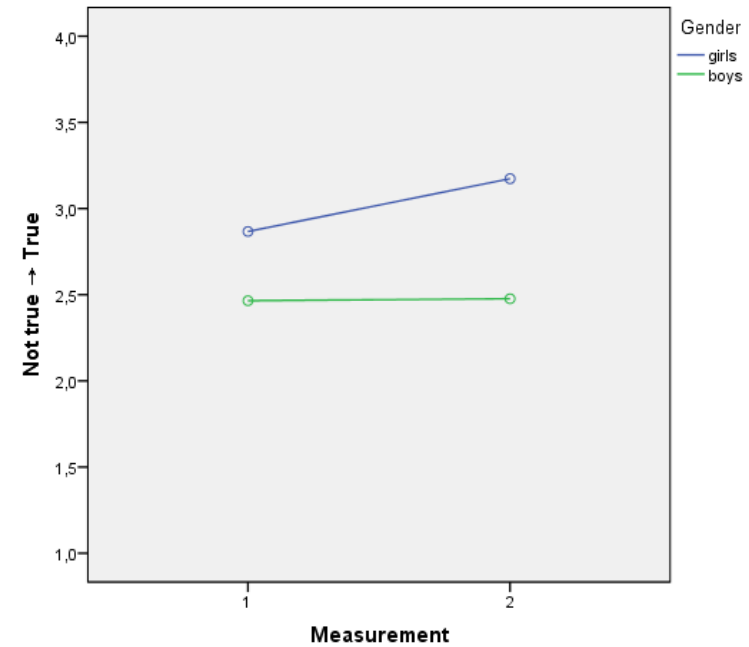
Main effect RoadSense: $F(1,157) = 3.55$; $p = .06$;
 Main effect Gender: $F(1,157) = 17.02$; $p < .001$; $\eta_p^2 = .098$
 Interaction effect RoadSense \times Gender: $F(1,157) = 6.46$; $p < .05$; $\eta_p^2 = .04$

When the driver acts dangerously, I tell him so.



Main effect RoadSense: $F(1,158) = 0.10$; $p = .76$;
 Main effect Gender: $F(1,158) = 9.10$; $p < .05$; $\eta_p^2 = .049$
 Interaction effect RoadSense \times Gender: $F(1,158) = 4.15$; $p < .05$; $\eta_p^2 = .026$

It doesn't sound cool to ask a driver to drive cautiously

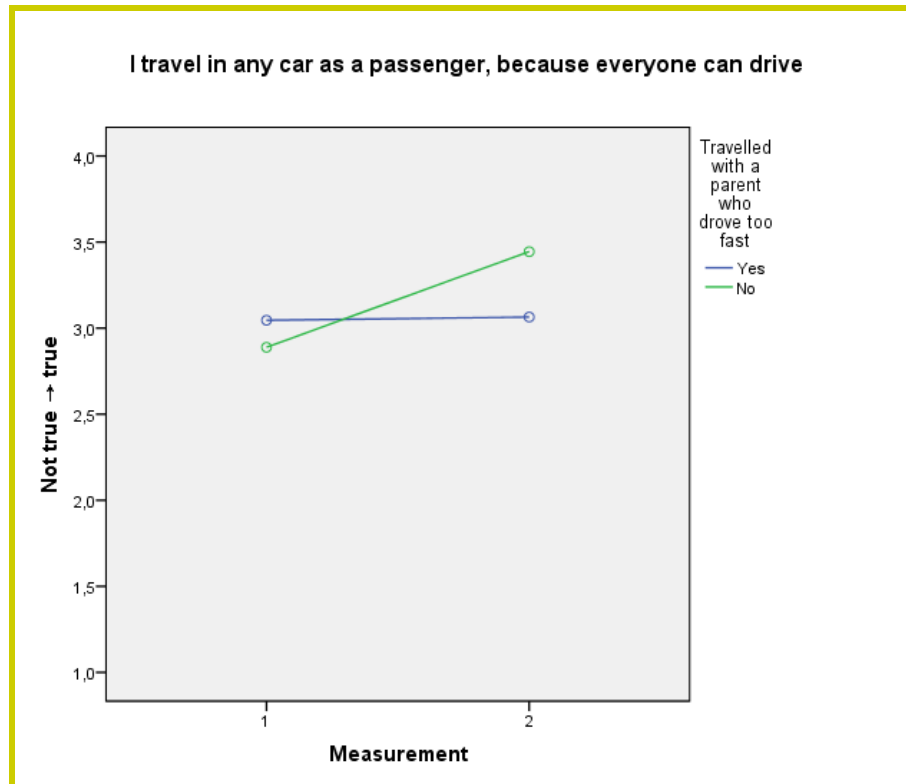


Main effect RoadSense: $F(1,159) = 3.42$; $p = .07$;
 Main effect Gender: $F(1,159) = 23.74$; $p < .001$; $\eta_p^2 = .13$
 Interaction effect RoadSense \times Gender: $F(1,159) = 2.93$; $p = .09$

Riding with parents who speeded

Yes = 110

No = 18

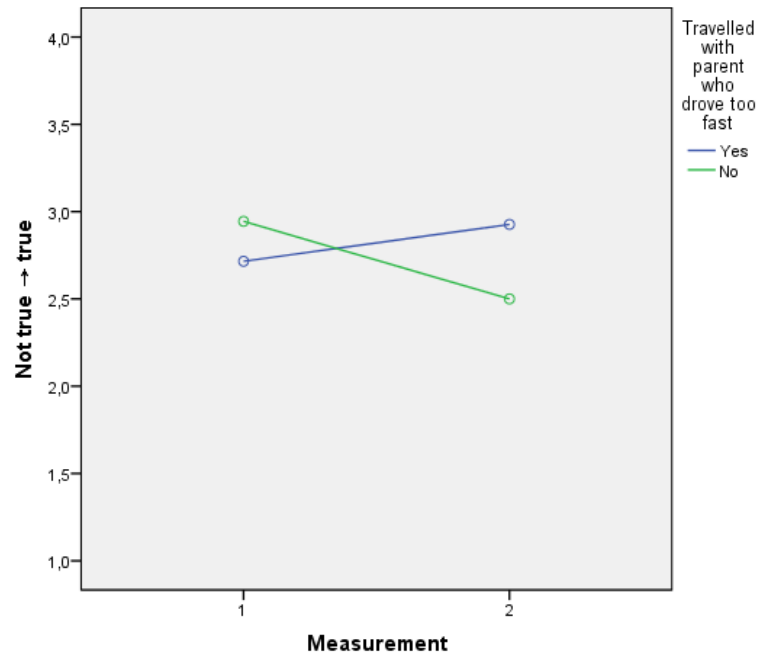


Main effect RoadSense: $F(1,125) = 4.40$; $p < .05$; $\eta_p^2 = .034$
 Main effect Parent that drove too fast: $F(1,125) = 0.55$; $p = .46$
 Interaction effect RoadSense \times Parent that drove too fast: $F(1,125) = 3.86$;
 $p = .05$; $\eta_p^2 = .03$



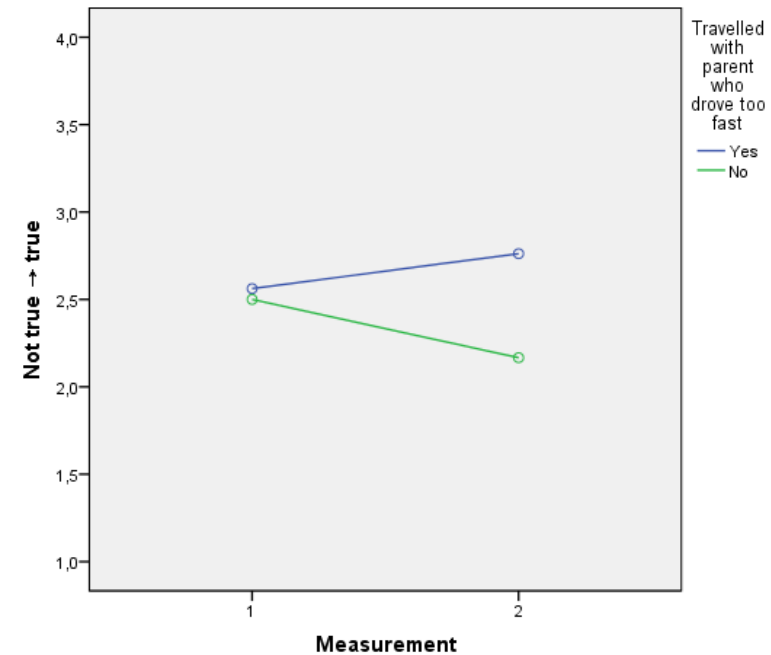
Main effect RoadSense: $F(1,125) = 5.01$; $p < .05$; $\eta_p^2 = .039$
 Main effect Parent that drove too fast: $F(1,125) = 2.20$; $p = .14$
 Interaction effect RoadSense \times Parent that drove too fast: $F(1,125) = 9.93$;
 $p < .005$; $\eta_p^2 = .074$

I can explain clearly how illicit drugs and alcohol affect road safety

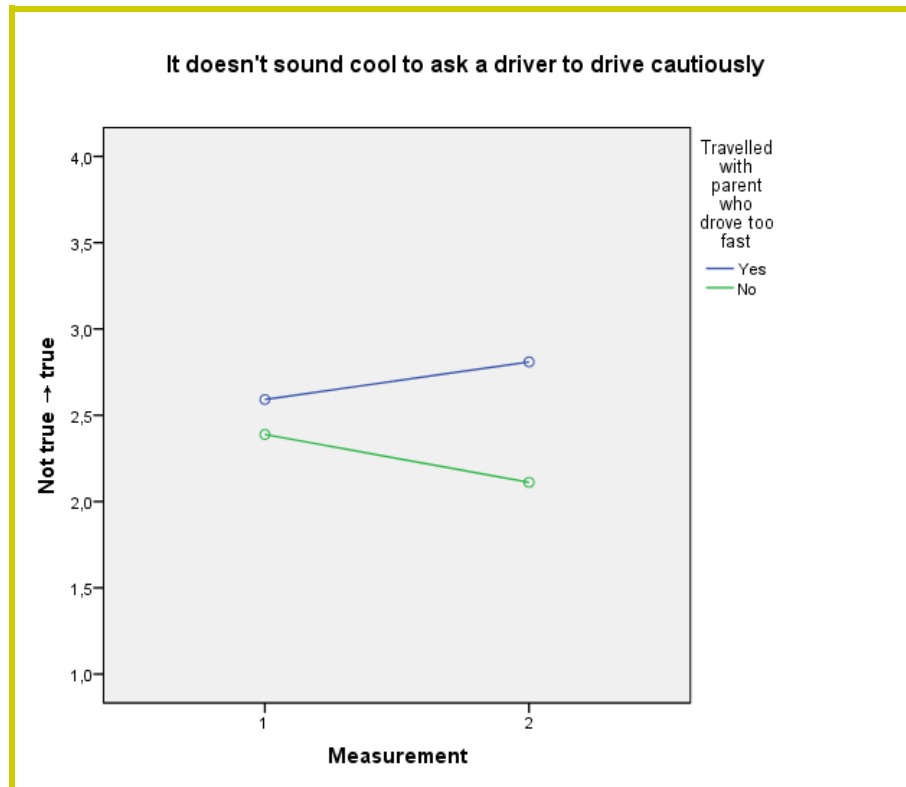


Main effect RoadSense: $F(1,125) = 1.11$; $p = .29$;
Main effect Parent that drove too fast: $F(1,125) = 0.31$; $p = .58$;
Interaction effect RoadSense × Parent that drove too fast: $F(1,215) = 8.77$;
 $p < .005$; $\eta_p^2 = .066$

I travel with a friend who drives dangerously



Main effect RoadSense: $F(1,121) = 0.33$; $p = .57$;
Main effect Parent that drive too fast: $F(1, 121) = 3.36$; $p = .07$;
Interaction effect RoadSense × Parent that drove too fast: $F(1,121) = 5.25$;
 $p < .05$; $\eta_p^2 = .042$



Main effect RoadSense: $F(1,126) = 0.05$; $p = .83$

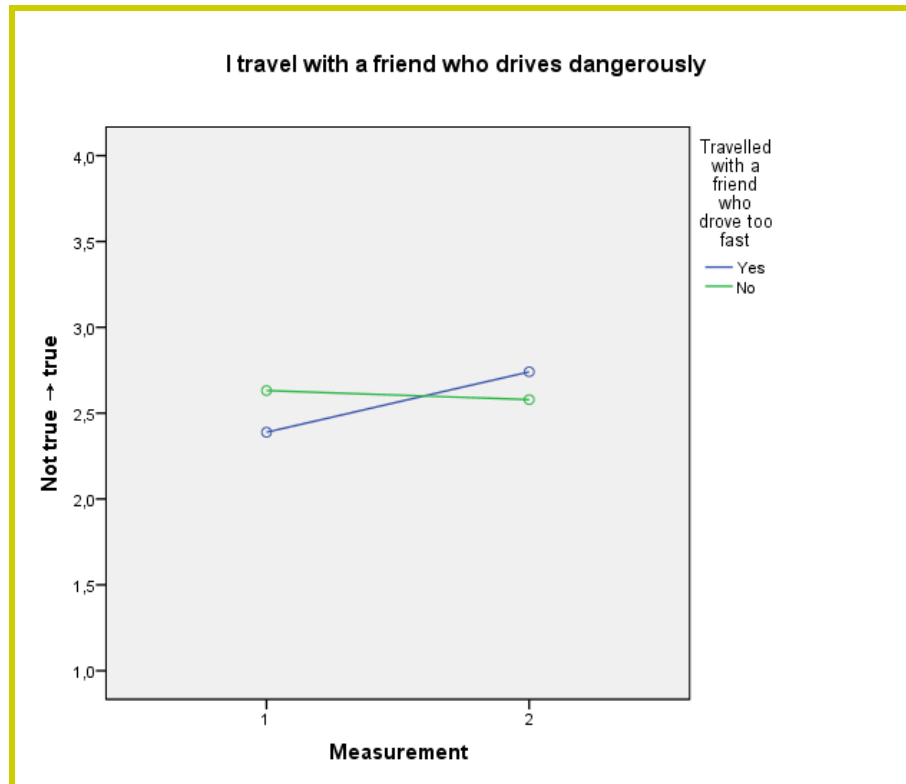
Main effect Parent that drive too fast: $F(1,126) = 5.35$; $p < .05$; $\eta_p^2 = .04$

Interaction effect RoadSense \times Parent that drove too fast: $F(1,126) = 3.32$; $p = .07$

Riding with friends who speed

Yes = 56

No = 58



Main effect RoadSense: $F(1,109) = 3.18$; $p = .08$

Main effect Friend that drove too fast: $F(1,109) = 0.90$; $p = .77$

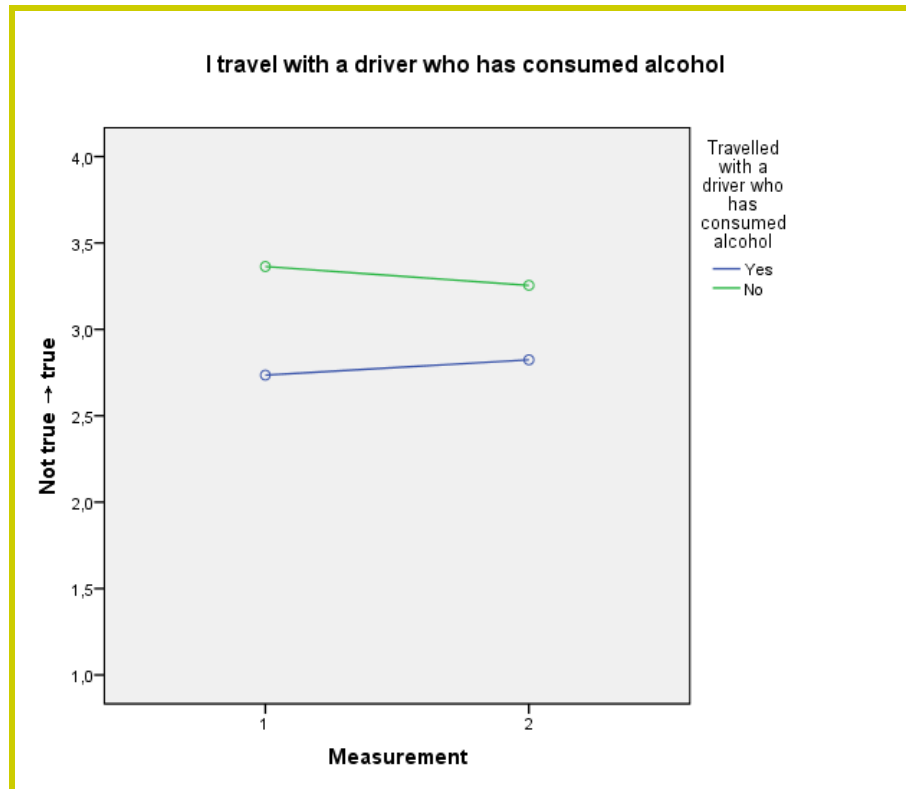
Interaction effect RoadSense × Friend that drove too fast: $F(1,109) = 5.81$;

$p < .05$; $\eta_p^2 = .051$

Riding with driver who had been drinking too much

Yes = 36

No = 111



Main effect RoadSense: $F(1,142) = 0.02$; $p = .89$

Main effect Drunk driver: $F(1,142) = 1.61$; $p = .21$

Interaction effect RoadSense × Drunk driver: $F(1,142) = 13.00$; $p < .001$;

$\eta_p^2 = .084$

Riding with driver who drove dangerously

Yes = 38

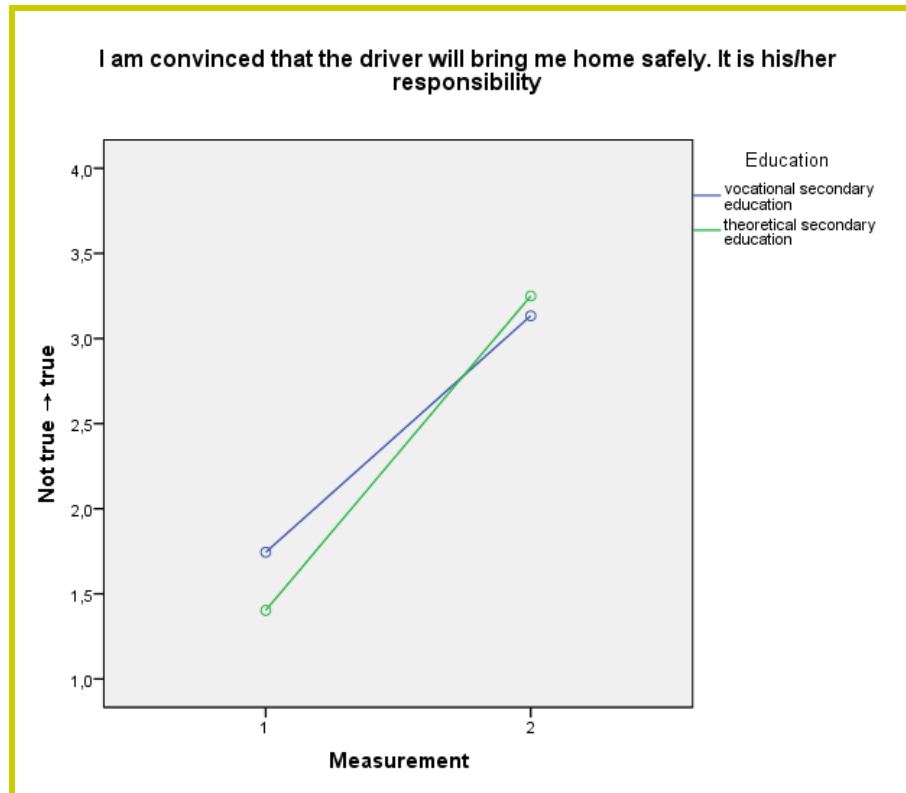
No= 110

No significant difference between groups, no interaction effects

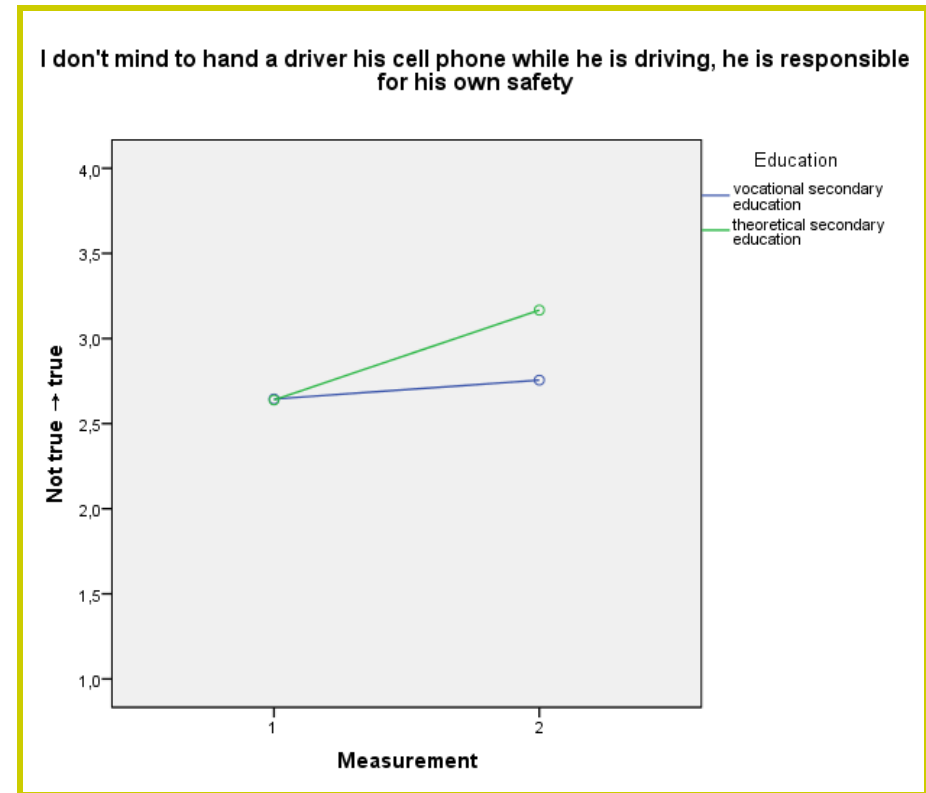
Education

Vmbo (vocational education) = 90

Havo/vwo (theoretical secondary education)= 72



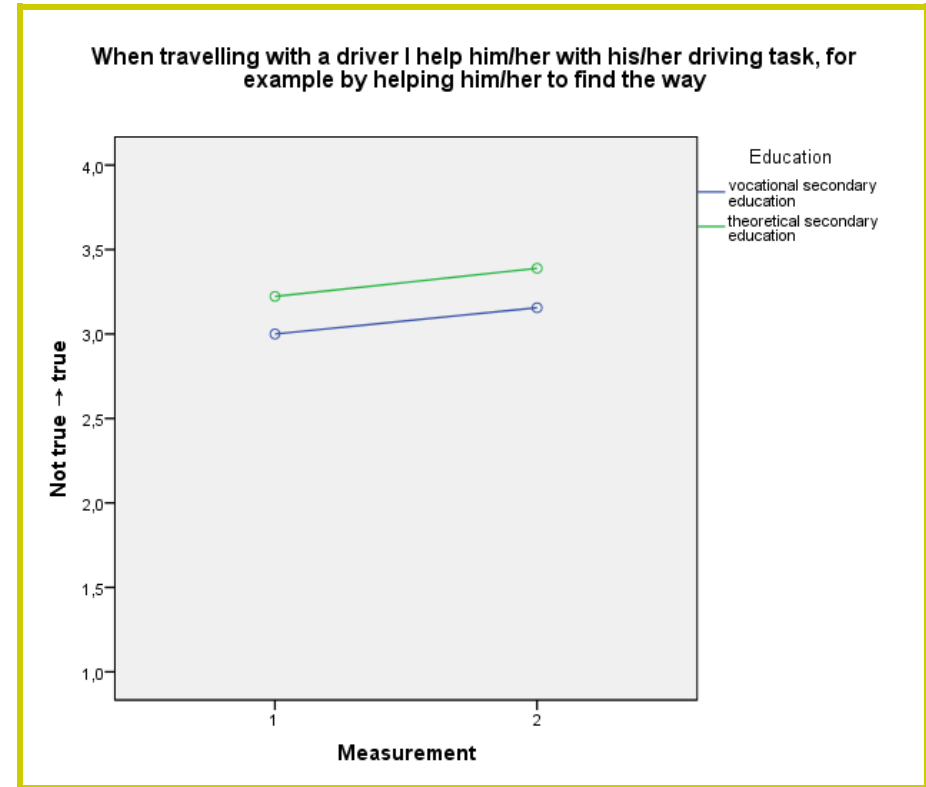
Main effect RoadSense: $F(1,160) = 397.27$; $p < .001$; $\eta_p^2 = .713$
 Main effect Education: $F(1,160) = 1.80$; $p = .18$
 Interaction effect RoadSense \times Education: $F(1,160) = 7.97$; $p = 0.005$;
 $\eta_p^2 = .05$



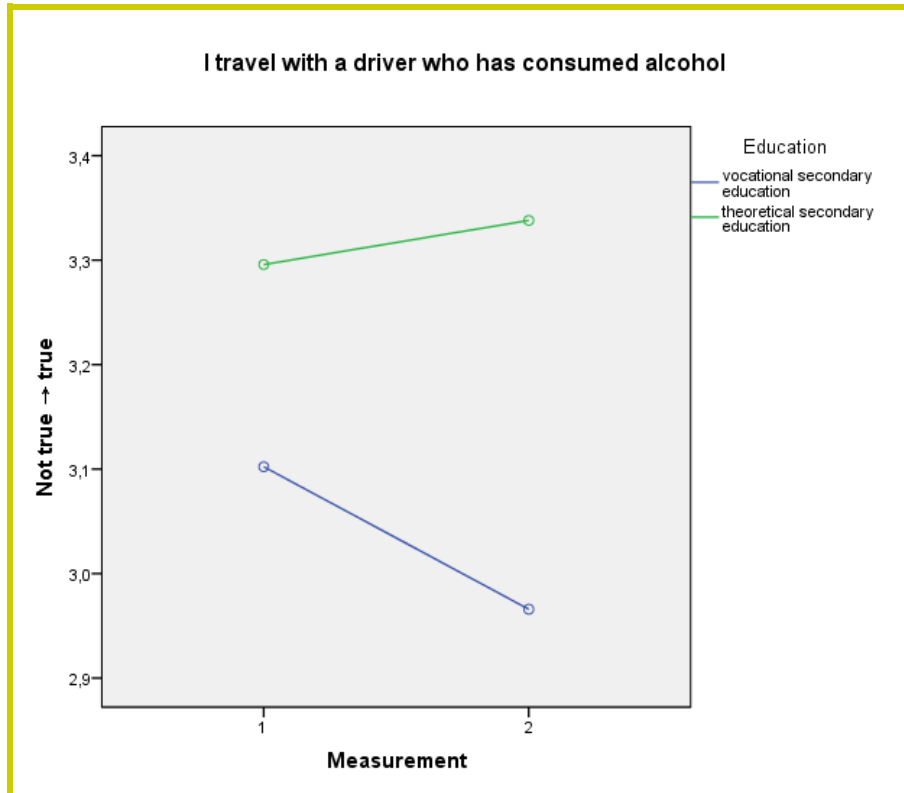
Main effect RoadSense: $F(1,160) = 23.15$; $p < .001$; $\eta_p^2 = .126$
 Main effect Education: $F(1,160) = 2.61$; $p = .11$
 Interaction effect RoadSense \times Education: $F(1,160) = 9.85$; $p < .05$;
 $\eta_p^2 = .058$



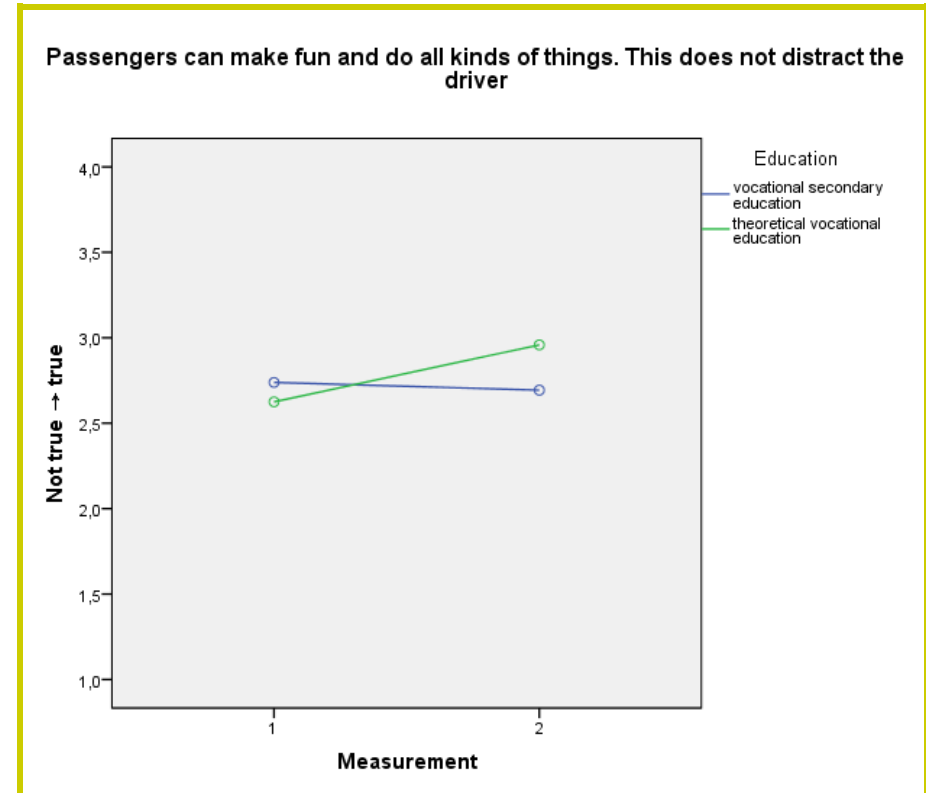
Main effect RoadSense: $F(1,159) = 0.25$; $p = .62$
 Main effect Education: $F(1,159) = 6.67$; $p < .05$; $\eta_p^2 = .04$
 Interaction effect RoadSense \times Education: $F(1,159) = 0.72$; $p = .40$



Main effect RoadSense: $F(1,160) = 5.12$; $p < .05$; $\eta_p^2 = .031$
 Main effect Education: $F(1,160) = 6.48$; $p = .01$; $\eta_p^2 = .039$
 Interaction effect RoadSense \times Education: $F(1,160) = 0.01$; $p = .94$

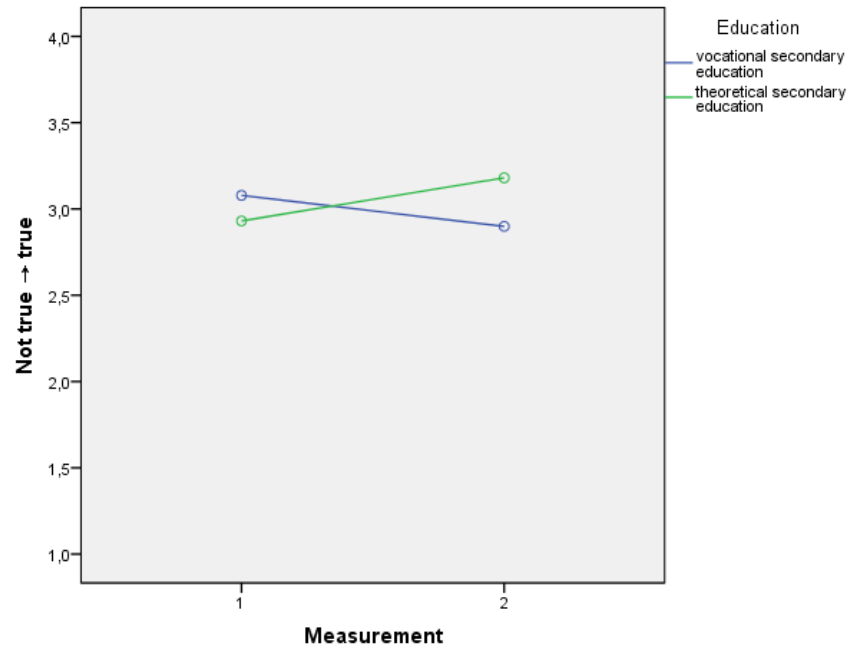


Main effect RoadSense: $F(1,157) = 0.05$; $p = .46$
 Main effect Education: $F(1,157) = 5.25$; $p < .05$; $\eta_p^2 = .032$
 Interaction effect RoadSense \times Education: $F(1,157) = 1.98$; $p = .16$



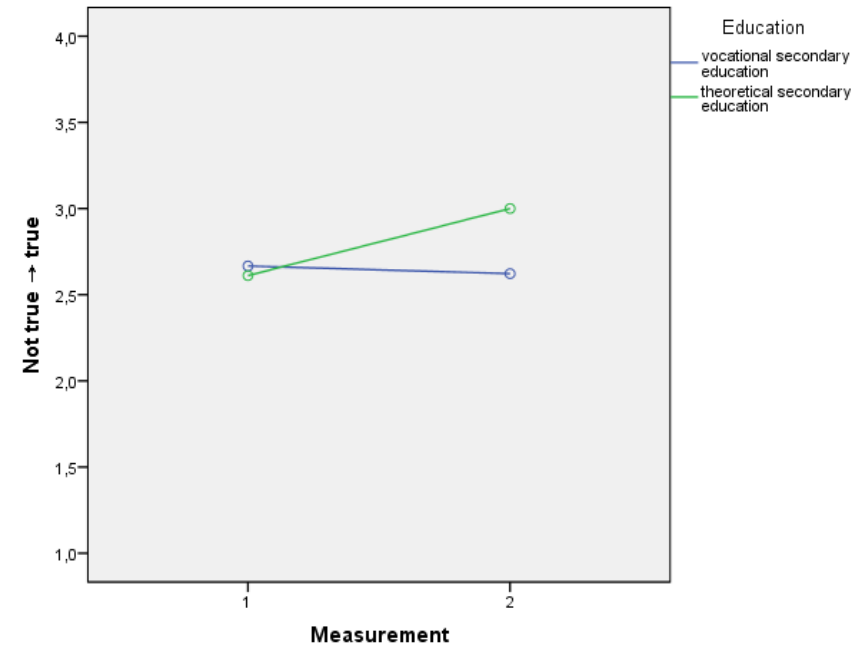
Main effect RoadSense: $F(1,158) = 3.99$; $p = .05$; $\eta_p^2 = .025$
 Main effect Education: $F(1,158) = 0.38$; $p = .54$
 Interaction effect RoadSense \times Education: $F(1,158) = 6.92$; $p < .05$;
 $\eta_p^2 = .042$

When the driver acts dangerously, I tell him so



Main effect RoadSense: $F(1,159) = 0.23$; $p = .60$
 Main effect Education: $F(1,159) = 0.44$; $p = .51$;
 Interaction effect RoadSense × Education: $F(1,159) = 10.38$; $p < .05$ $\eta_p^2 = .061$

It doesn't sound cool to ask a driver to drive cautiously



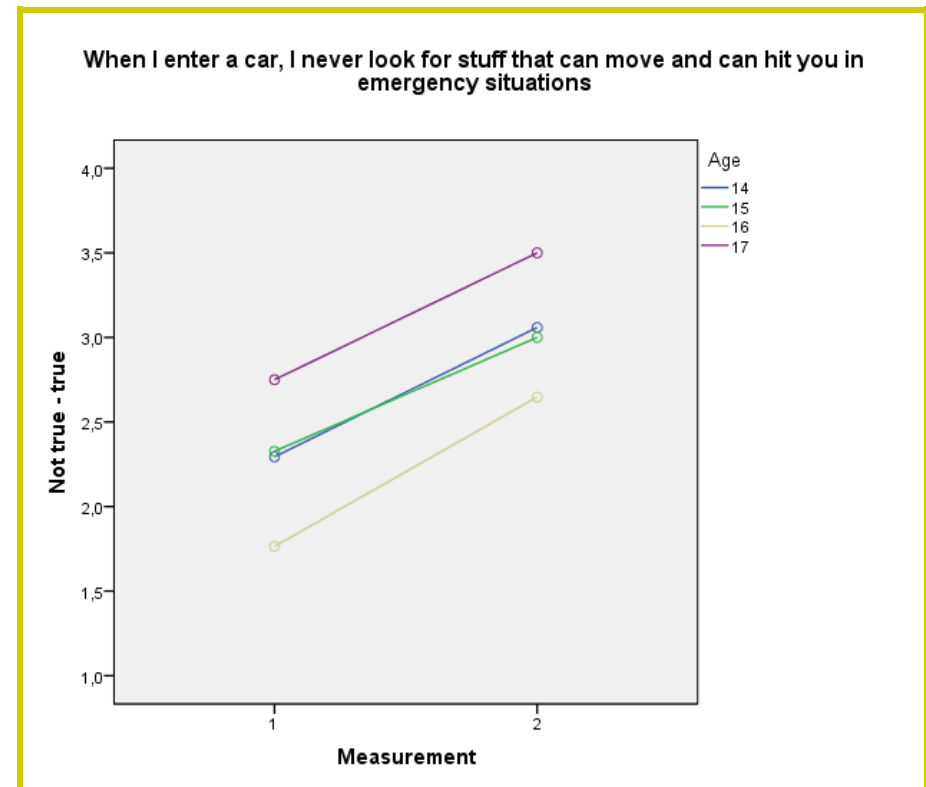
Main effect RoadSense: $F(1,160) = 4.11$; $p < .05$; $\eta_p^2 = .025$
 Main effect Education: $F(1,160) = 1.75$; $p = .19$;
 Interaction effect RoadSense × Education: $F(1,160) = 6.50$; $p < .05$; $\eta_p^2 = .039$

Age

14 year old = 35
15 year old = 105
16 year old = 17
17 year old = 4

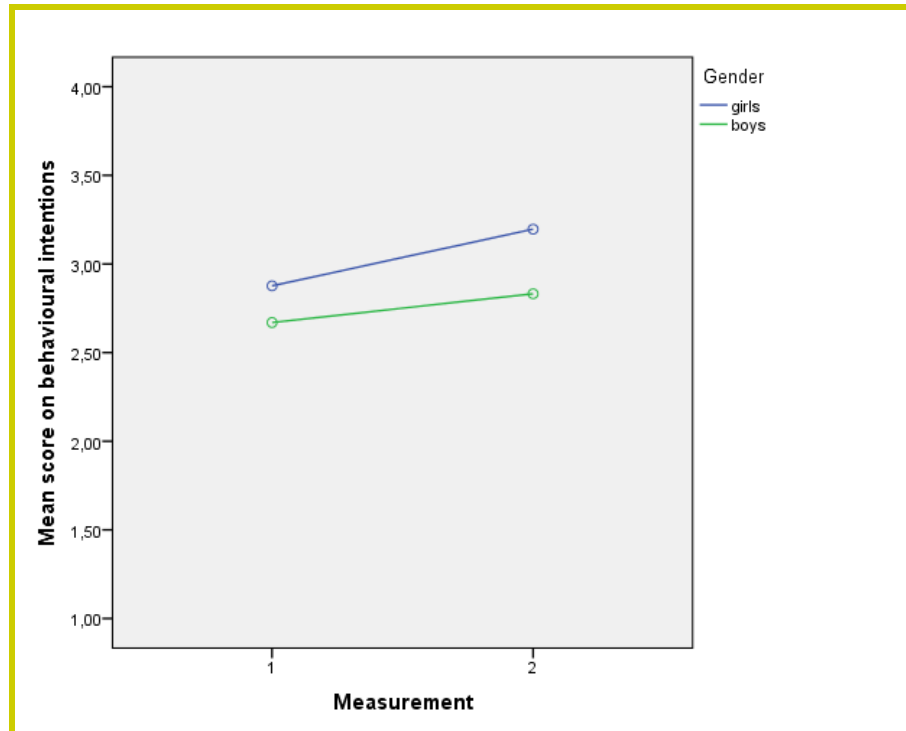


Main effect RoadSense: $F(1,156) = 6.92$; $p < .05$; $\eta_p^2 = .042$
Main effect Age: $F(3,156) = 0.80$; $p = .50$
Interaction effect RoadSense \times Age: $F(3,156) = 3.08$; $p < .05$; $\eta_p^2 = .056$



Main effect RoadSense: $F(1,155) = 19.13$; $p < .001$; $\eta_p^2 = .11$
Main effect Age: $F(3,155) = 4.17$; $p < .01$; $\eta_p^2 = .075$
Interaction effect RoadSense \times Age: $F(3,155) = 0.18$; $p = .91$

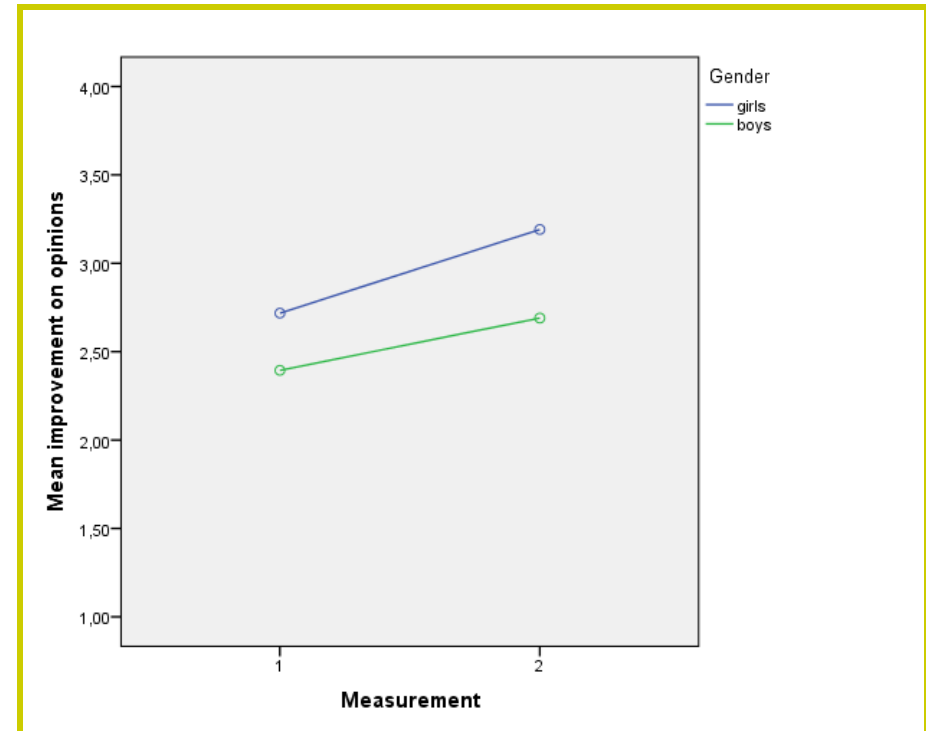
Improvement by gender



Main effect RoadSense: $F(1,154) = 45.89$; $p < .001$; $\eta_p^2 = .23$

Main effect Gender: $F(1,154) = 22.10$; $p < .001$; $\eta_p^2 = .13$

Interaction effect RoadSense \times Gender: $F(3,154) = 4.93$; $p < .05$;
 $\eta_p^2 = .031$



Main effect RoadSense: $F(1,158) = 89.51$; $p < .001$; $\eta_p^2 = .36$

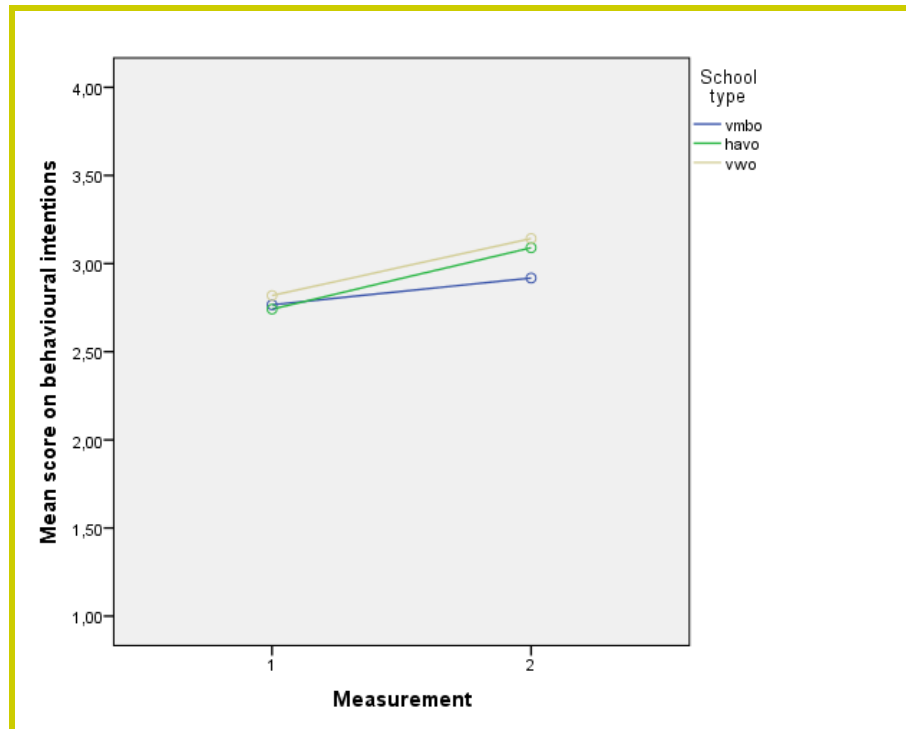
Main effect Gender: $F(3,158) = 39.76$; $p < .001$; $\eta_p^2 = .20$

Interaction effect RoadSense \times Gender: $F(3,158) = 4.75$; $p < .05$;
 $\eta_p^2 = .029$

Improvement by school type

Vmbo (vocational education)

Havo/vwo (theoretical secondary education)

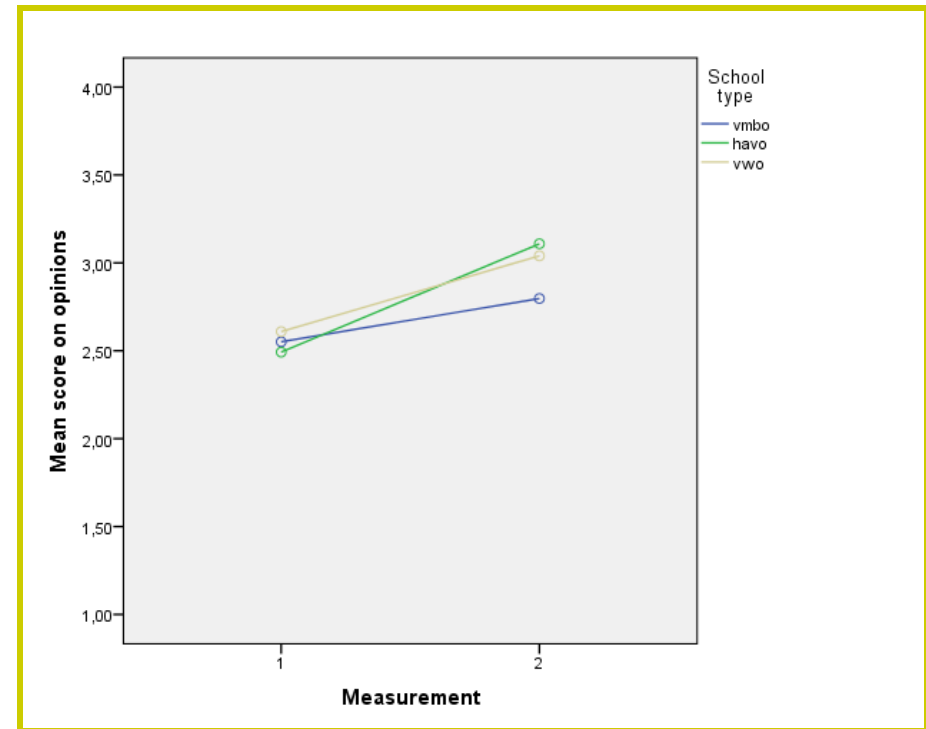


Main effect RoadSense: $F(1,153) = 49.75; p < .001; \eta_p^2 = .25$

Main effect School type: $F(2,153) = 1.40; p = .25;$

Interaction effect RoadSense \times School type: $F(2,153) = 3.48; p < .05;$

$\eta_p^2 = .044$

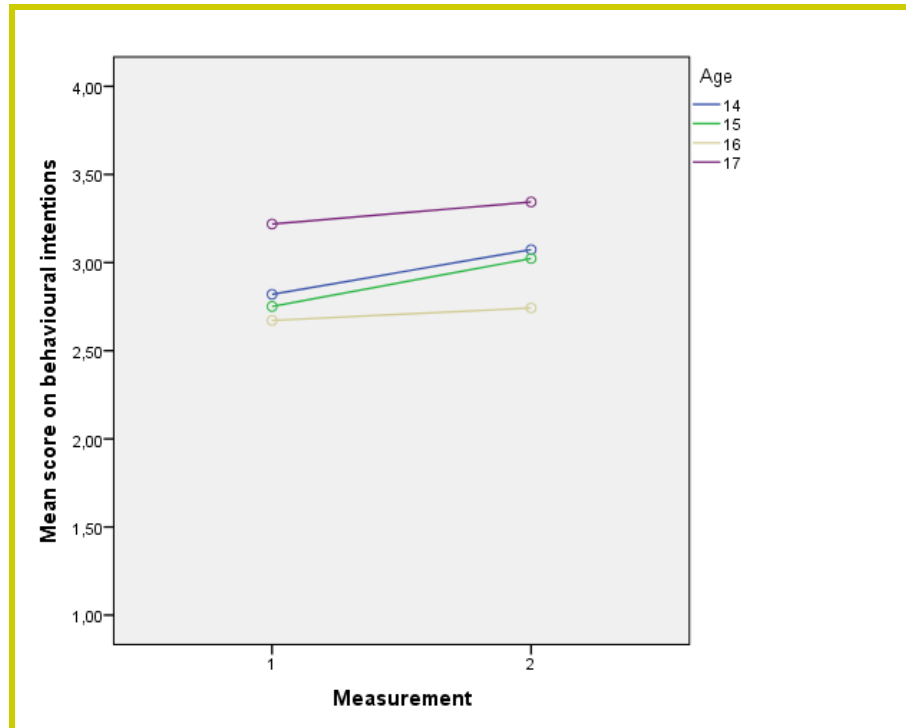


Main effect RoadSense: $F(1,157) = 97.89; p < .001; \eta_p^2 = .38$

Main effect School type: $F(2,157) = 8.19; p < .001; \eta_p^2 = .094$

Interaction effect RoadSense \times School type: $F(2,157) = 1.77; p = .17$

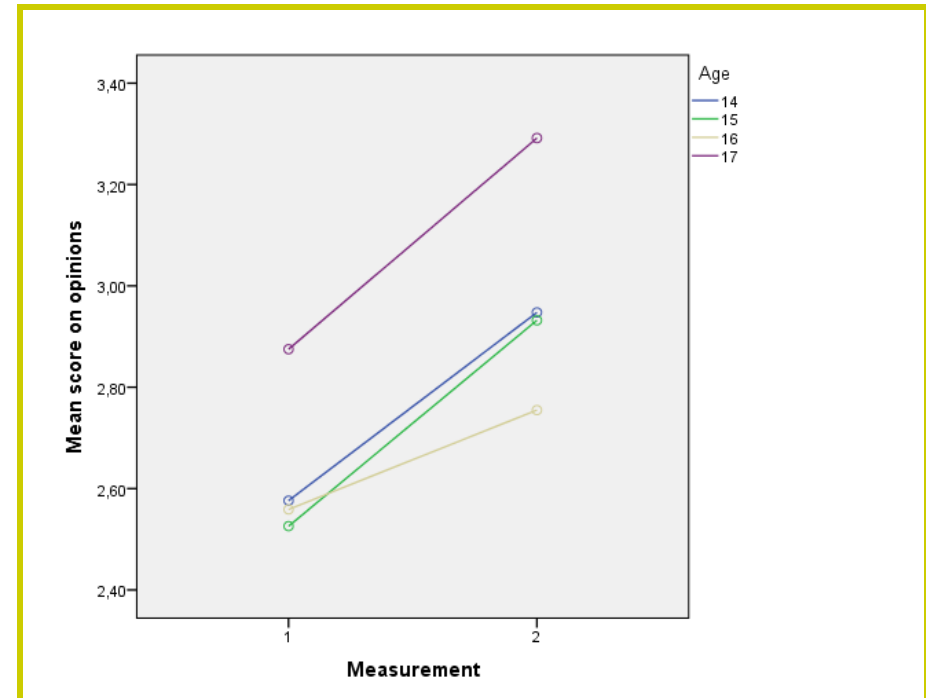
Improvement by age



Main effect RoadSense: $F(1,151) = 7.45$; $p < .05$; $\eta_p^2 = .05$

Main effect Age: $F(3,151) = 2.66$; $p = .05$; $\eta_p^2 = .02$

Interaction effect RoadSense \times Age: $F(3,151) = 1.05$; $p = .37$;



Main effect RoadSense: $F(1,155) = 20.54$; $p < .001$; $\eta_p^2 = .17$

Main effect Age: $F(3,155) = 0.97$; $p = .41$;

Interaction effect RoadSense \times Age: $F(3,155) = 0.08$; $p = .49$;