

Appendix

1. Methods

Development of the perceived descriptive safety related driving norms measure

(PDDN): A list of 8 questions was developed describing various unsafe behaviors that were common in the Arab towns\vilages. As the residents of these towns and vilages live in close proximity they are aware of how their friends and relatives drive and they are very aware of the driving behavior norms in their town or vilage. This is a close nit community, where "everybody knows everybody and almost everything about them". This list was compiled by distributing a form via email to a convenience sample of 20 people from the Arab communities. The respondents were asked to describe unsafe driving behaviors that were common among Arab drivers inside and outside the vilages\towns. A total of 80 such behaviors were suggested by the participants. Eight unsafe behaviors were chosen as they were suggested by all 20 participants. These included behaviors such as, use of car restraints for adults and children, parking in places that disturb other drivers or pedestrians, driving without a driving license, and driving while speaking on a hand held cell-phone. The behaviors are presented in table 1. A questionnaire was designed including 16 questions, two for each behavior, asking for the respondents to estimate the percent of drivers performing this behavior within their town\vilage and outside the town\vilage. The respondents were asked to rate their answers on a scale of 1 to 5, were 1 indicated a very low percentage of drivers who act according to the described behavior, and 5 indicated a very high percentage performing the behavior. A "do not know" option was available but was not read out. For table 1 categories 1 and 2 and categories 4 and 5 were combined. Some of the items were reversed so that higher scores indicated unsafe descriptive norms. To test this questionnaire a pretest with random telephone interviews with 50 Arab participants was performed. These participants were selected randomly from the telephone book. The internal reliability test of the pretest was Cronbach's alpha= 0.78. In the final large sample the Cronbach's alpha was 0.76 for both the 8 questions describing norms within the towns\vilages and the 8 questions describing norms outside the towns\vilages. Factor analysis was also performed and all items loaded on to one factor. Combined mean variables representing perceived descriptive safety-related driving norms within and outside the towns\vilages were calculated. Higher scores indicated more frequently performed unsafe norms.

Statistical analysis: Bivariate analysis was applied to determine the association between involvement in car crashes, PDDN, attitudes toward traffic safety laws, traffic law violations and demographic variables. Pearson's correlation and t-test analyses were conducted to identify statistical significance. Logistic regression was used to identify the factors associated with self-reported involvement in a car crash as a driver. Variables found significant in the bivariate analysis were added to the regression path analysis.

In order to determine if the town\ village in which the respondent lived was a factor in the association between descriptive norms and the other factors a two-level hierarchical linear model (HLM) with a random effect was conducted. Only variables with a p-value of less than 0.05 were left in the model after backward elimination. A logarithmic transformation was performed for the dependent variables describing descriptive driving norms within and outside the town\ village. A reversal of the variable values for the norms outside the town\ village was performed only for the HLM with this variable as the dependent variable. These transformations were performed to fit the normal distribution needed for the models. In the HLM, high scores of the variable PDDN within the town\ village indicate more positive norms, whereas high scores of the variable PDDN outside town\ village indicate more negative norms.

Finally, Path analysis was used to explore the relationship between norms, attitudes, traffic law violations and involvement in car-crash. The path analysis tested a conceptual model (Fig 1), analyzing the relations between the variables placed together on the conceptual model, confirming model fit, effect sizes, and allowing us to test all of the dependent variables in one model. Norms and attitudes were hypothesized to impact directly involvement in car-crash and traffic law violations. Traffic law violations, was hypothesized to impact directly involvement in car-crash. Due to supposed relationships between gender and age, norms, attitudes, traffic law violations and involvement in car-crash, gender and age were placed in the model as exogenous variables. We also assumed driving distance per month would affect attitudes, traffic law violations and involvement in car-crash. But as driving distance per month may also be affected by gender it was treated as an endogenous variable.

The analysis was performed by the statistical software AMOS 19. The software was also used to explore further relations between the variables. Before the analysis began, multicollinearity were calculated. For all independent variables, variance inflation factors were below 1.7, which indicates a lack of multicollinearity.

2. Results

Appendix Table 1:

A correlation analysis revealed that PDDN within and outside the town/village were significantly correlated with each other. Interviewees estimating PDDN to be unsafe within the towns/villages also estimated the norms to be unsafe outside the town/village, yet the correlation strength was not very high ($r=0.28$) (table 1 appendix). PDDN within the town\illage had a low but significant negative correlation with attitudes ($r=-0.10$). Those with more positive attitudes towards traffic safety laws reported the PDDN within the town/village to be less safe. Attitudes towards traffic safety laws and traffic law violations (DBQ) were comparatively highly correlated ($r=0.59$). PDDN outside the town were not associated with attitudes towards traffic safety laws or with traffic law violations in the bivariate analysis (table 1 appendix). Gender was negatively correlated to age ($r=-0.22$) and to distance driven per month ($r=-0.28$). In addition, age and PDDN were significantly associated, i.e. the older the respondent was, the higher were his/her estimations of the PDDN (Table 1 appendix).

Appendix Table 1: Correlations between descriptive driving norms within and outside the town/village, and other variables. (Pearson correlation)

	Descriptive norms out of the town	Attitudes	Traffic law violations	Age	Gender	Distance driven per month
Descriptive norms (PDDN) within the town	0.28**	-0.10*	0.08*	0.08*	-0.04	-0.05
Descriptive norms (PDDN) outside the town	1	-0.05	-0.01	0.12*	-0.15**	-0.02
Attitudes		1	0.59**	0.20*	0.9*	0.09*
Traffic law violations			1	0.32*	0.03	-0.02
Age				1	-0.22**	0.10*
Gender					1	-0.28**
Driving distance per month						1

*p<0.05

**p< 0.001

Appendix Table 2-3:

As PDDN in and outside the town\ village differed significantly between the town\ village there was a need to take this second level into account when identifying factors associated with PDDN. Therefore, a two level hierarchical linear model (HLM) with a random effect analysis was performed to identify factors associated

with both the PDDN within and outside the town/village (table 2-3). The size of the town and its socioeconomic level was tested on the town level. However, they were not statistically significantly associated with PDDN both within and outside the town/village, therefore deleted from the final models. On the individual level, age, gender, religion, attitudes, traffic law violations and involvement in a car crash were added to the models. In table 2 and 3 only variables with a p value under 0.05 were left in the multilevel models presented. From table 2 it seems that younger respondents and women estimated the PDDN outside the town to be less safe. Those involved in a car crash estimated the PDDN outside the town also to be less safe and those estimating safer PDDN within the town also estimated safer norms outside the town.

In table 3, again, town level variables (size and SES) did not predict PDDN within the town/village. Age, gender, religion and involvement in car crashes were tested, however these were not found to be associated with PDDN within the town/village in the HLM, therefore not added to the final model. On the individual level only PDDN outside the town/village, attitudes towards traffic safety laws and traffic law violations were associated with PDDN within the town/village in the HLM. As in the previous model, respondents with safer PDDN outside of the town/village also reported safer PDDN within the town/village. In addition, respondents with more positive attitudes towards traffic safety laws estimated the PDDN within the town/village to be less safe and respondents reporting less frequent traffic law violations reported better PDDN within the town/village.

Appendix table 2: Multi-level regression model for the chance of reporting negative descriptive norms outside the town

	Estimate	Standard Error	t-ratio (value?)	P value
Constant	1.076	0.055	19.45	<0.0001
<i>Individual predictors</i>				
Age	-0.002	0.0009	-2.16	0.031
Gender- Male	-0.055	0.023	-2.38	0.018
Descriptive norms within the town	-0.103	0.018	-5.68	<0.0001
Involvement in a car crash	0.055	0.023	2.37	0.018
<i>Town predictors</i>				
-	-	-	-	-

Appendix Table 3: Multi-level regression model for the chance of reporting negative descriptive norms within of the town

	Estimate	Standard Error	t-ratio (value?)	P value
Constant	0.24	0.099	2.43	0.015
<i>Individual predictors</i>				
Descriptive norms out of town	0.12	0.019	6.66	<0.001
Attitudes	-0.056	0.018	-3.02	0.003
Traffic law violations	0.066	0.015	4.29	<0.001
<i>Town predictors</i>				
-	-	-	-	-