Attitude towards Walk/Bike Environments and its Influence on Students' Travel Behavior: Evidence from NHTS, 2009

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Outline

- Background
- Objectives
- Previous research
- Data
- Modeling results
- Conclusion and recommendations

Background

- 1969 - half of all students walked or bicycled to school.

- Today- fewer than 15% of all school trips are made by walking or bicycling, and over half of all children arrive at school in private automobiles

- Safety issues-big concern for parents

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Objectives of the research

- Analyze how students and/or parents' view of issues related to the walking and biking environments

- Examining the implication of their attitude on students' travel behavior (mode choice), and the **vice versa** (causal relationship)

Previous studies

- The influences on parental attitudes towards their children walking and bicycling to school

- The relationship between mode of travel to school and the full range of factors that might affect mode choice

- Attitude vs choice-well studied

- The remaining question is:
  - Could choice affect attitude?
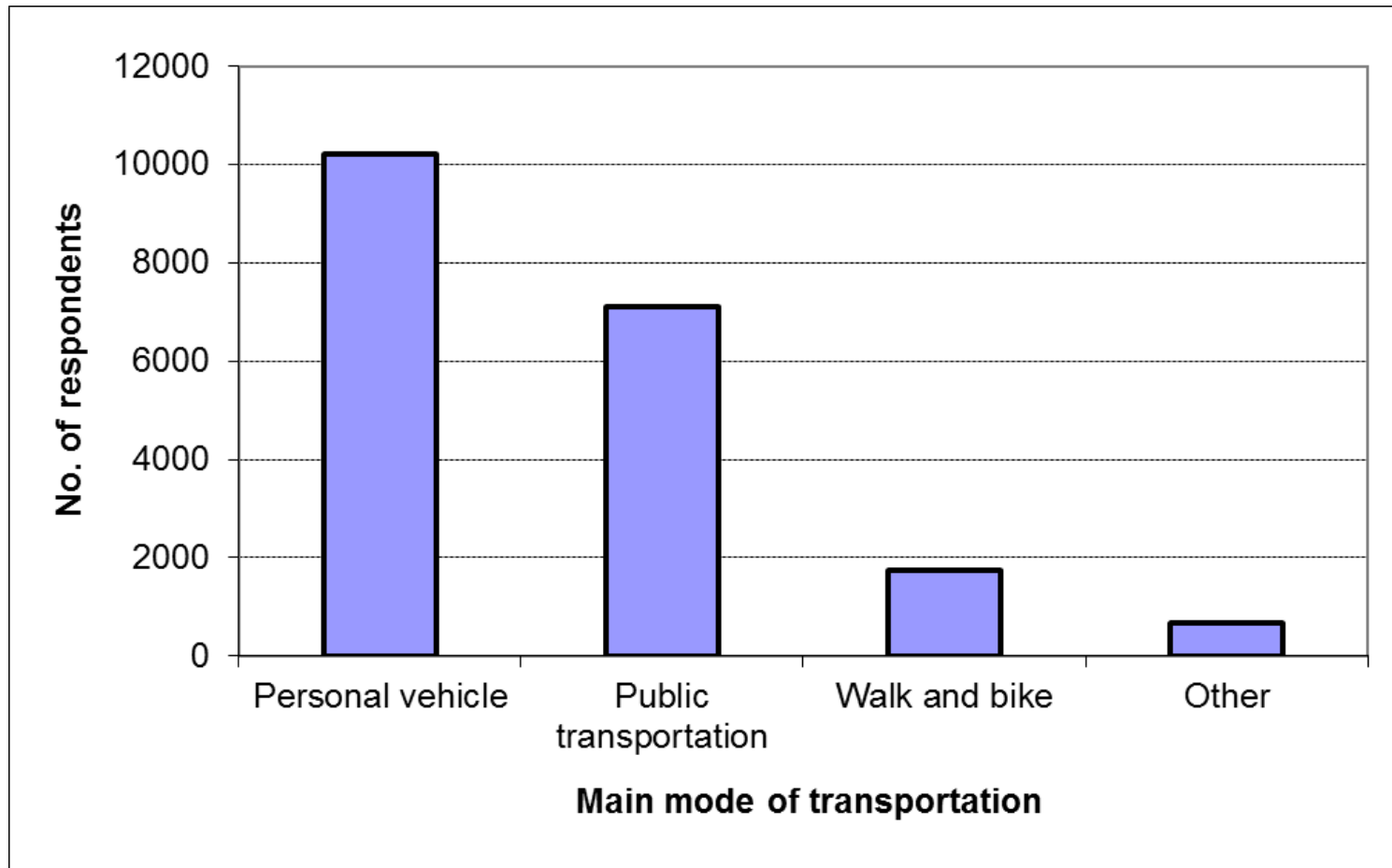 - Is choices for trips to and from school are similar?

Data

- NHTS 2009
- Home-based school trips
- Dependent Variable: mode choice
- Independent variables:
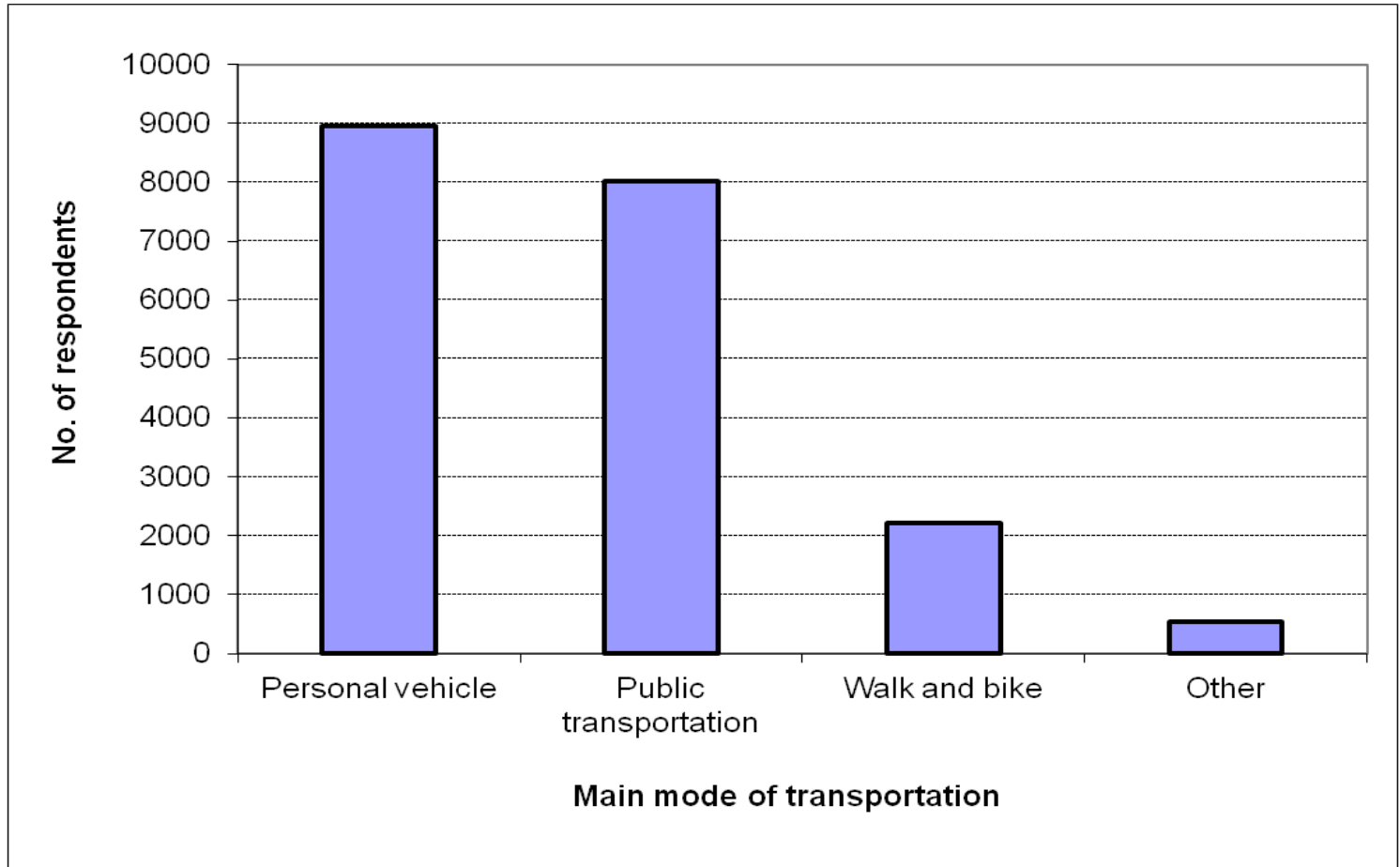 - Attitude variables
  - HH-related variables
  - Personal info

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Mode choice for trips to school


N=19733

Mode choice for trips from school

N=19733

Attitude variables

	NOT AN ISSUE	A LITTLE BIT OF AN ISSUE	SOMEWHAT OF AN ISSUE	VERY MUCH AN ISSUE	A SERIOUS ISSUE	RF	DK
a. the distance between home and school? Would you say it's not an issue, a little bit of an issue, somewhat of an issue, very much an issue, or a serious issue? **(SCHDIST)**	1	2	3	4	5	-7	-8
b. the amount of traffic along the route? [Would you say it's not an issue, a little bit of an issue, somewhat of an issue, very much an issue, or a serious issue?] **(SCHTRAF)**	1	2	3	4	5	-7	-8
c. the speed of traffic along route? **(SCHSPD)**	1	2	3	4	5	-7	-8
d. violence or crime along route? **(SCHCRIM)**	1	2	3	4	5	-7	-8
e. poor weather or climate in your area? **(SCHWTHR)**	1	2	3	4	5	-7	-8

Issues
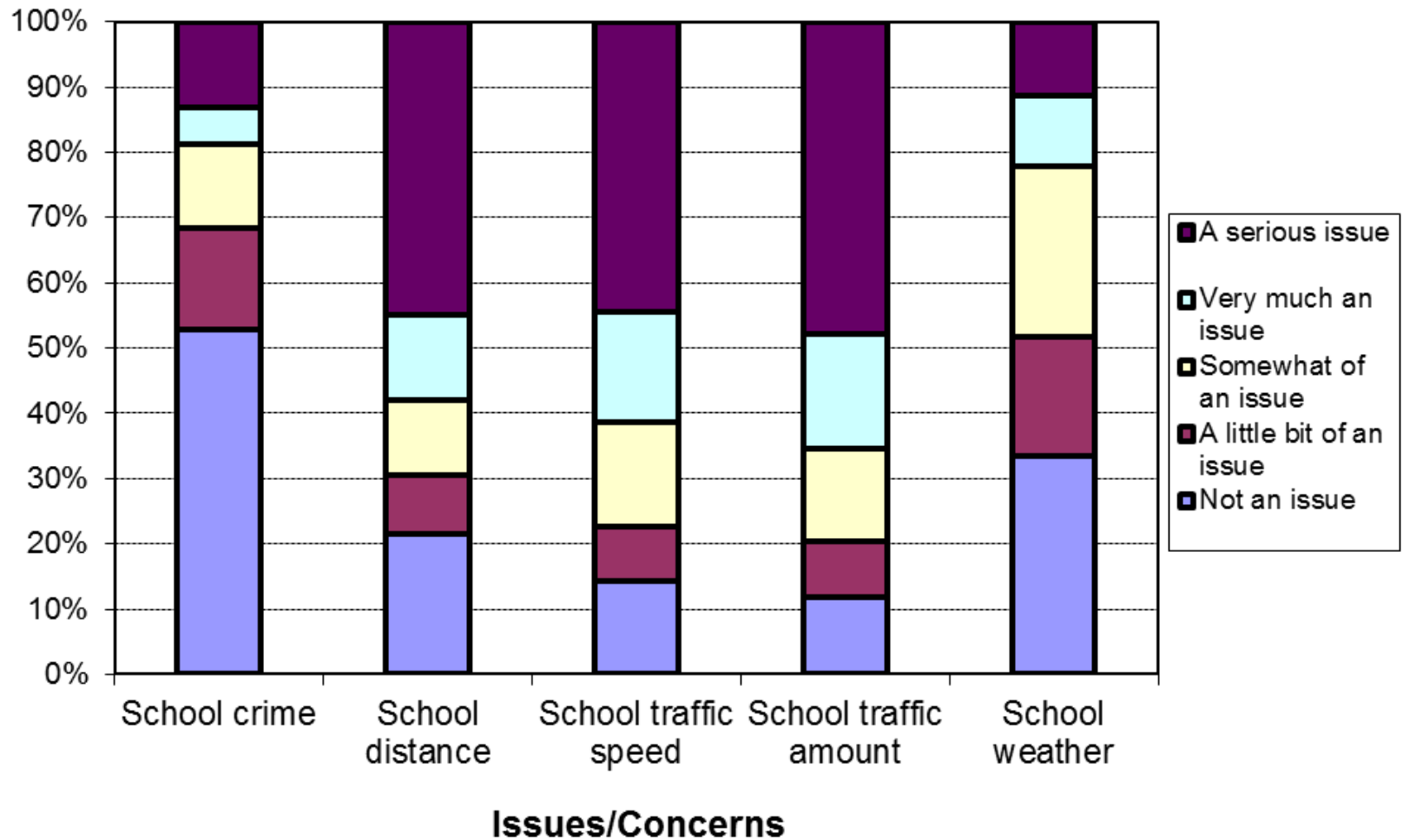
Mode choice for trips to school vs attitude
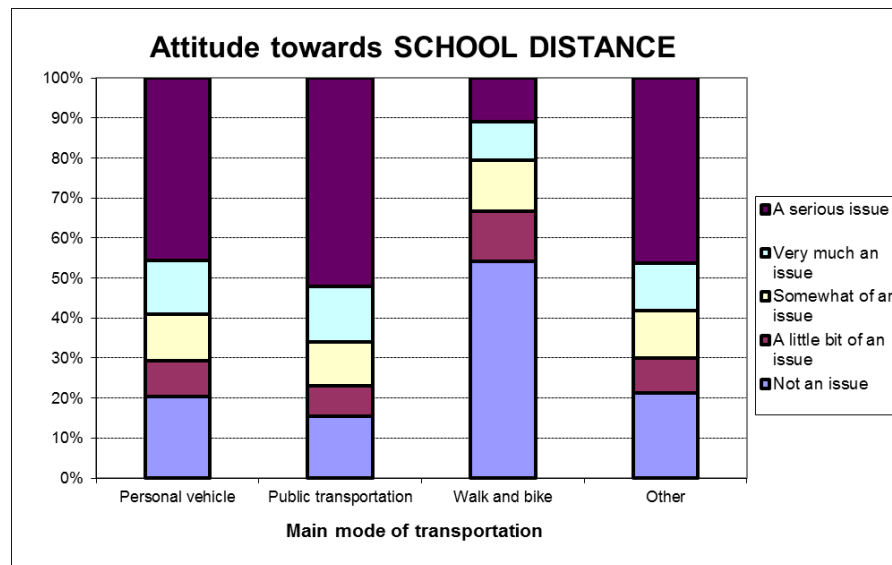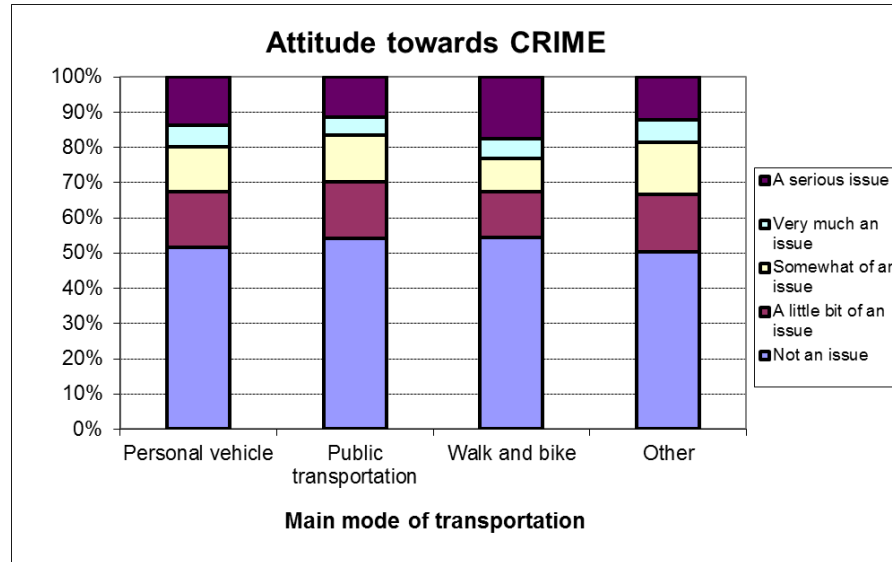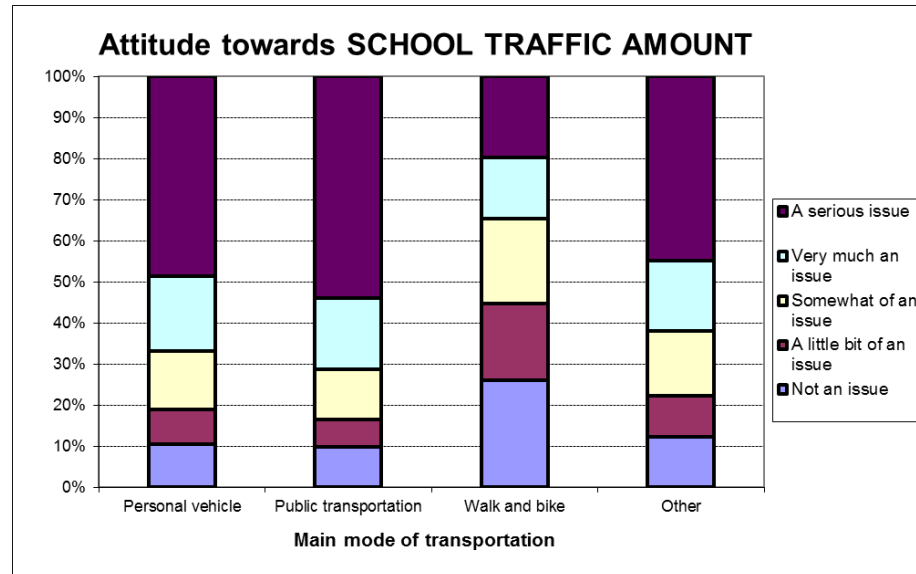
Mode choice for trips to school vs attitude

Mode choice for trips to school vs attitude

Attitude towards SCHOOL WEATHER

Mode choice for trips from school vs attitude

Mode choice for trips from school vs attitude
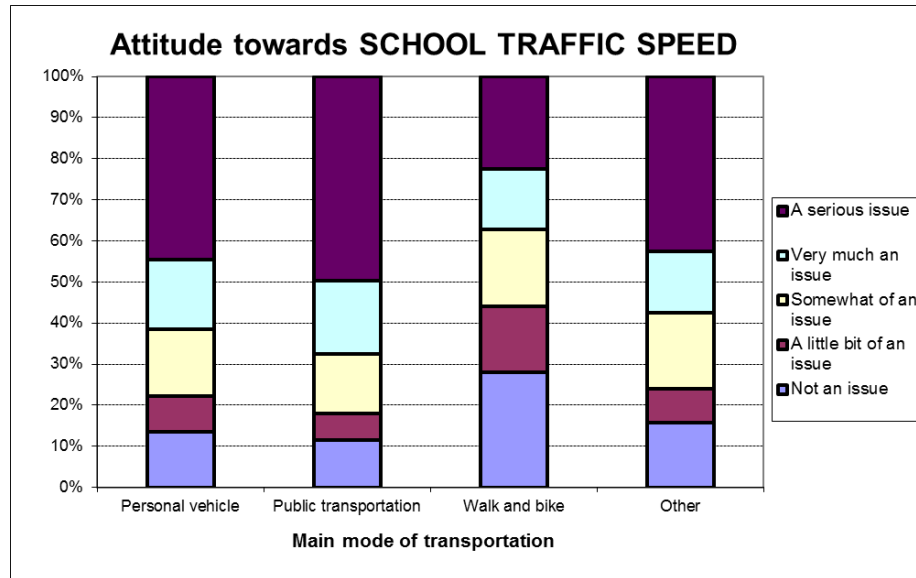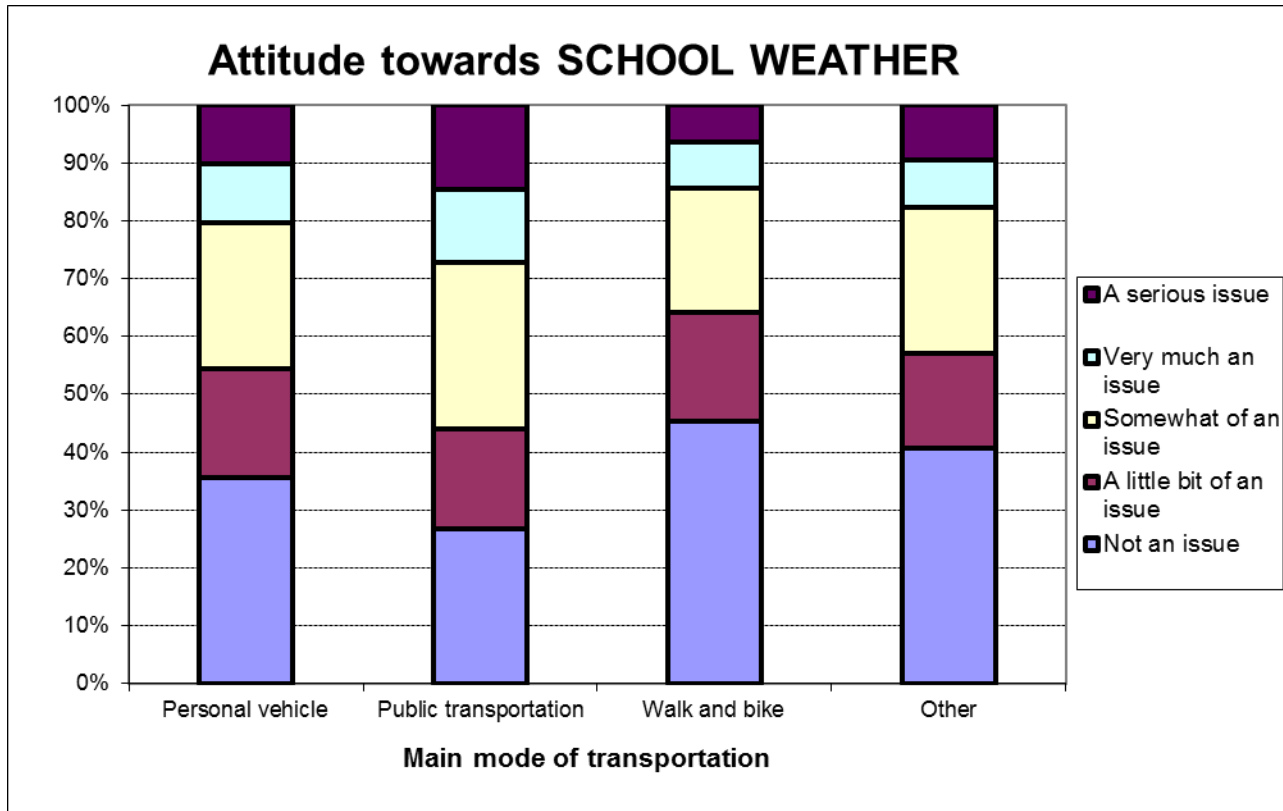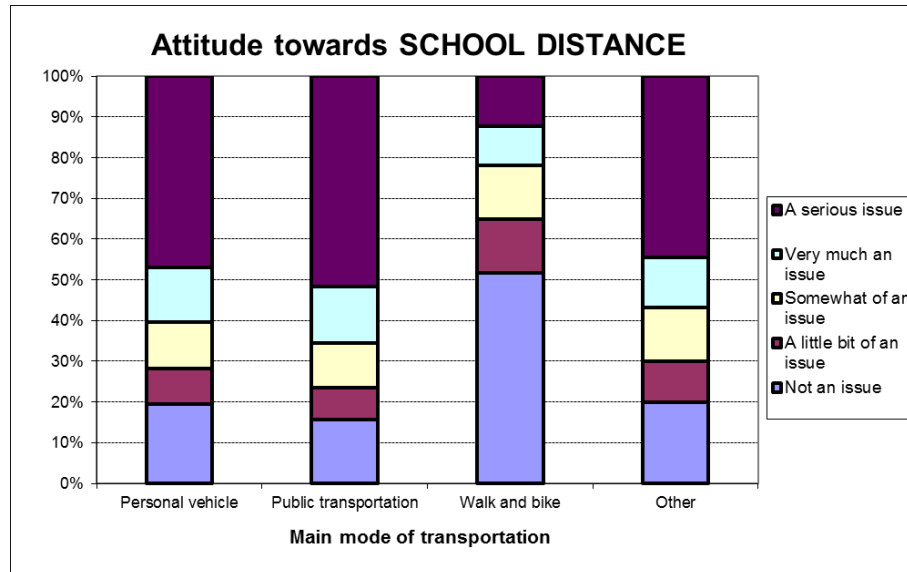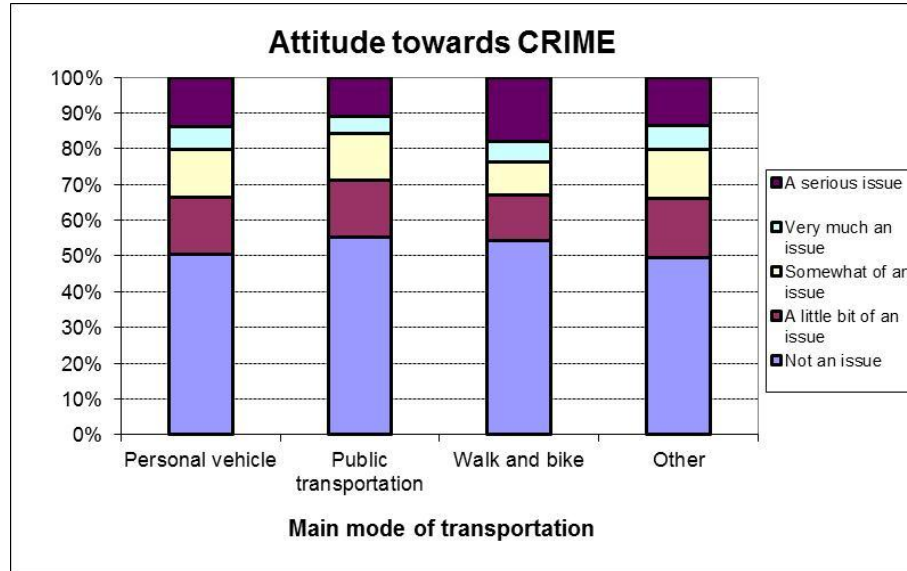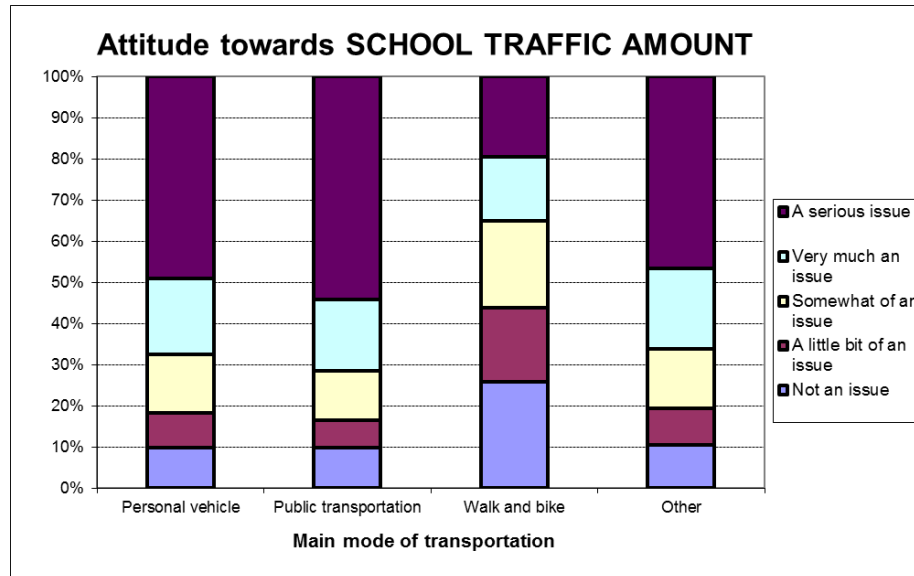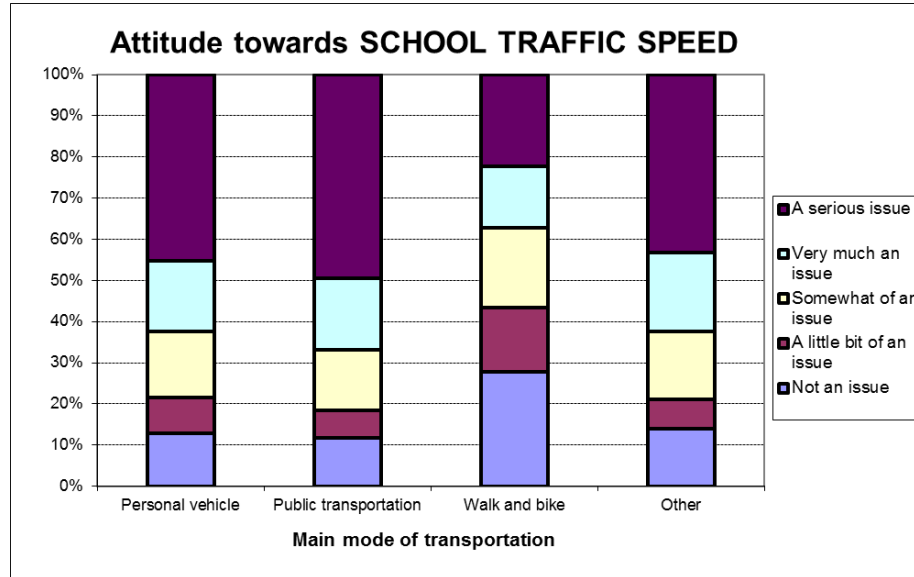
Mode choice for trips from school vs attitude
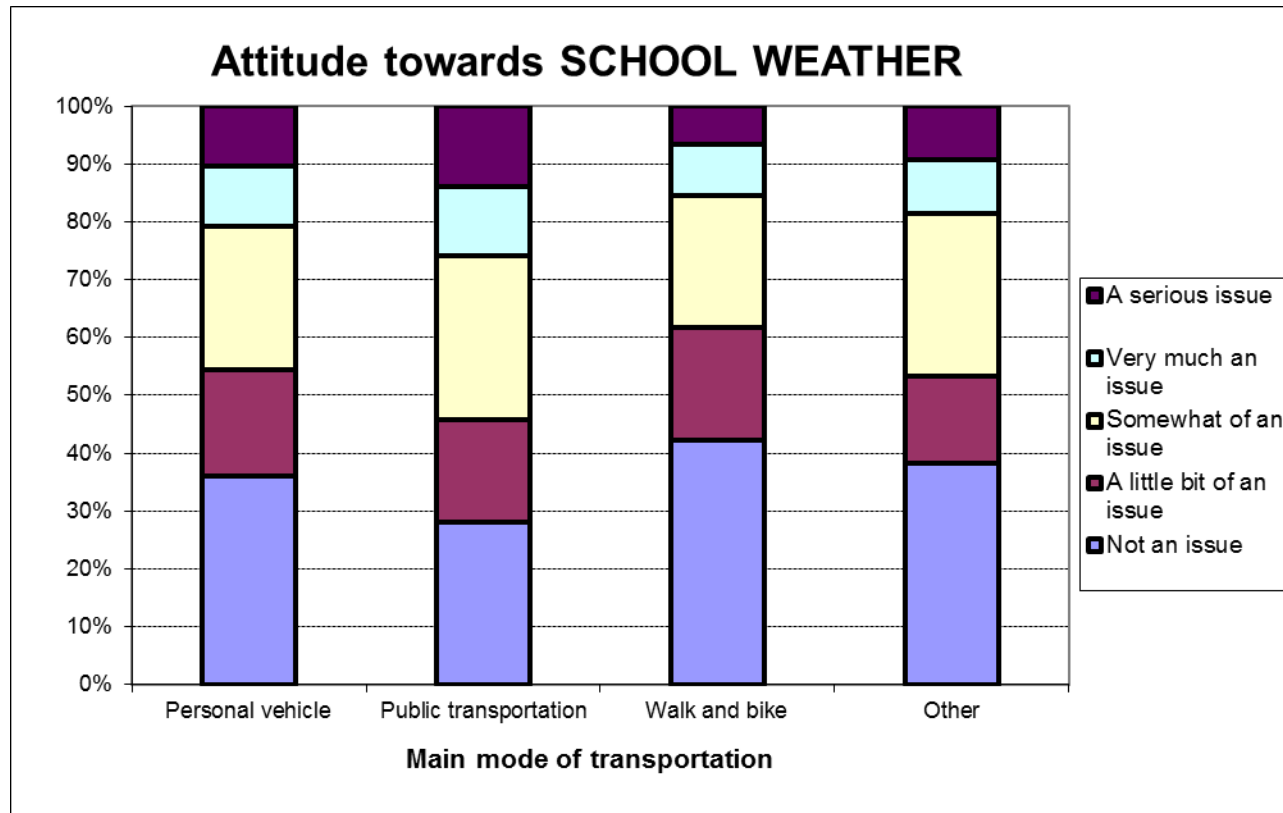
Modeling

- Multinomial regression analysis
  - To investigate the effect of attitude on mode choice and/or the effect of mode choice on attitude

Description of data used for the analysis

	Mean	Median	Skewness	Minimum	Maximum
Mode of travel to school	1.64	1.00	1.150	1	4
Mode of travel from school	1.71	2.00	0.903	1	4
violence/crime along route	2.11	1.00	0.998	1	5
distance between home & school	3.51	4.00	-0.526	1	5
speed of traffic along route	3.69	4.00	-0.715	1	5
amount of traffic along route	3.81	4.00	-0.854	1	5
poor weather or climate in area	2.48	2.00	0.453	1	5
Number of drivers in HH	2.18	2.00	0.983	0	9
Derived total HH income	13.38	16.00	-0.817	1	18
Count of HH members	4.13	4.00	1.097	2	13
Count of HH vehicles	2.44	2.00	1.405	0	14
HH race	1.54	1.00	2.986	1	7
Urban size	4.20	4.00	-0.557	1	6
Respondent's gender	1.49	1.00	0.041	1	2
Day trips for this respondent	3.24	3.00	0.732	0	17
Respondent's age	10.30	10.00	-0.112	5	16
Distance time ratio	0.416	0.333	3.305	0.0	5.0
School type	1.14	1.00	2.117	1	2

N=19733

Modeling results

For trips to school

Attitude variables	Personal car	Public transportation	Walk/bike
violence/crime along route	+	+	-
distance between home & school	NA	-	-
speed of traffic along route	NA	+	NA
amount of traffic along route	+	+	-
poor weather or climate in area	+	+	+

NA= statistically insignificant variables, + is a positive relationship, - is a negative relationship

- Parents who said violence along the route is an issue- more drive, more PT, less walk/bike
- Parents who said distance is an issue- Less PT, less walk/bike
- Parents who said speed is an issue- more PT
- Parents who said traffic is an issue- More drive, more PT, less walk/bike
- Parents who said weather is an issue- seems not to have a negative effect on mode choice

For trips to school

Attitude variables	Personal car	Public transportation	Walk/bike
Number of drivers in HH	NA	-	-
Derived total HH income	NA	NA	NA
Count of HH members	NA	+	+
Count of HH vehicles	+	-	-
HH race- White	NA	-	NA
HH race- African American	+	+	+
HH race- Asian only	NA	+	NA
HH race- American Indian, Alaskan	NA	NA	NA
HH race- Native Hawaiian, other pacific	NA	+	NA
HH race- Multicultural	NA	NA	NA
HH race- Hispanic/Mexican	+	+	+
HH race- Other	Reference variable		
Urban size- 50000-199999	+	NA	+
Urban size- 200000-499999	+	NA	+
Urban size- 500000-999999	+	+	+
Urban size- 1000000+ without subway/rail	+	+	+
Urban size- 1000000+ with subway/rail	+	+	+
Urban size- Not in urban area	Reference variable		

Less PT and less walk/bike

Less PT and less walk/bike

No effect

For trips to school

Attitude variables	Personal car	Public transportation	Walk/bike
Respondent's gender-Male	-	NA	NA
Respondent's gender- Female	Reference variable		
day trips for this respondent	NA	NA	+
Respondent's age	NA	NA	NA
Distance time ratio	NA	-	-
School type	-	+	+

Less drive and more PT, walk/bike

Trip FROM school shows no significant change

Modeling results: attitude on mode choice or mode choice on attitude?

	Violence/ crime	School Distance	School speed	School traffic	School weather
Personal Vehicle	NS	NS	+	+	+
Public transportation	-	+	+	+	+
Walk/bike	NS	+	-	-	-

- Drivers- complained about speed, traffic and weather
- PT users- complained about every issue except less concern about violence/crime
- Walkers/bikers- less concerned about all the issues except distance

Modeling results: attitude on mode choice or mode choice on attitude?

Attitude variables	Personal car	Public transportation	Walk/bike
violence/crime along route	+	+	-
distance between home & school	NA	-	-
speed of traffic along route	NA	+	NA
amount of traffic along route	+	+	-
poor weather or climate in area	+	+	+

	Violence/crime	School Distance	School speed	School traffic	School weather
Personal Vehicle	NA	NA	+	+	+
Public transportation	-	+	+	+	+
Walk/bike	NA	+	-	-	-

- parents who think traffic is an issue still use car and probably their dependency on the car gave them that idea
- parents who think school distance is an issue walk/bike less and probably their walk/bike experience gave them that idea

Conclusion

- Not a big different in mode choice to and from school

- As much as attitudes affect mode choice, the travel mode could also be a reason to develop attitude on some issues

- Latent variables are important for transportation demand analysis

- Newly identified significant variables—indicators for planners to encourage walking and cycling as a sustainable/healthy means of transportation

Conclusion

- Distance: one important factor discouraging walking and biking- urban planning intervention

- Crime/violence: more of perception than reality?- public outreach on safety

Thank you for your attention