2. New pedestrian-crossing regulation: changes in the behaviour of pedestrians and car drivers

An observational study

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2.1. INTRODUCTION AND OBJECTIVE

With effect from 1 June 1994, Switzerland's traffic regulations were changed to give the pedestrian the right of way at a pedestrian crossing when there is an evident intention on the part of the pedestrian to use the crossing. This makes the position of pedestrians much stronger because they are no longer required explicitly to signal car drivers that they intend to cross the road.

The objective of this study was to find out whether and to what extent the behaviour of drivers and pedestrians had changed in the year since the new regulation came into force.

2.2. STUDY DESIGN

Accordingly, before-and-after surveys were carried out. The pre-test took place at the end of May 1994. Four further observation sessions took place at intervals of approximately three months: in August and December 1994, and in March and May 1995. Initially, observations were made at a single pedestrian crossing only, but this was increased to three crossings for observation sessions 3 to 5. The study design is shown in Table 1. The before-and-after observations were made on the same day of the week in order to minimize the effect of day-to-day fluctuations.

Location	May '94	August '94	December '94	March '95	May '95
Berne, suburban area	X	X	X	X	X
Berne centre			X	X	X
La Chaux-de-Fonds (French-speaking)			X	X	X

Table 1:
Data collection locations and times

Because a full cross-over design was not available, analyses were done in two ways: First, the data from the Berne suburban area were used to determine the longitudinal section of pedestrian and car-driver behaviour development. These findings were then checked to see if they were also applicable to other locations and whether there were any changes between observation sessions 3 and 5. However, in the interests of simplicity the following presentation will be confined to the longitudinal-sectional development.

2.3. REPORT FORM

The report form (see Appendix), which was filled out by university student researchers, was intended for the recording of obvious patterns of behaviour only. Behaviour which could not be clearly observed (for example, eye contact) was not recorded. Reporting concerned only situations in which a pedestrian and one or more motor vehicles were involved. Apart from sex and approximate age, it was noted whether the pedestrian stopped before stepping on to the road, and whether vehicles drove past the pedestrian without stopping. It was also recorded whether there was a braking or stopping vehicle and whether the pedestrian had already stepped on to the road in such cases – in other words, whether the driver stopped voluntarily or was forced to stop by the pedestrian's presence in the road.

2.4. RESULTS

During the first observation session, 290 pedestrians were observed; during session 2 there were 228; during session 3, 206; during session 4, 118; and during session 5, 103 pedestrians.

At the time of the pre-test, 62.1 per cent of those observed were female, 37.9 per cent male. During the observation session immediately following the introduction of the new regulation, 65 per cent of those observed were female; during the third observation session, 72.4 per cent; during the fourth session, 63.6 per cent; and during the fifth, 74.8 per cent. These differences are not statistically significant (chi-square = 9.46, df = 4, p = .051).

The age profile of the persons observed also did not vary across the five observation sessions. A one-way analysis of variance revealed no significant differences (F = 2.83, df = 4, p = .220).

The first step in the analysis of the results was to establish whether the proportion of pedestrians who stopped at the pavement edge had changed. During the first three observation sessions, approximately 95 per cent of all pedestrians stopped while they were still on the pavement when there was a possibility of conflict with a vehicle. In sessions 4 and 5 this proportion dropped to 89.8 and 92.2 per cent respectively. This difference is significant (chi-square = 11.47, df = 4, p = .022). It is possible that more pedestrians were taking advantage of their new rights at pedestrian crossings. However, at approximately 10 per cent, the proportion of such pedestrians is very low.

The next part of the analysis was concerned with discovering whether the number of vehicles which drove past a waiting pedestrian had changed. During the first observation session an average of 2.65 vehicles drove past a waiting pedestrian. In observation sessions 2 – 5 the averages were 1.66, 1.71, 1.25 and 1.48 vehicles, respectively. This difference is highly significant (F = 19.6, df = 4, p = .000). A Scheffé multiple comparison test showed that only the results from observation session 1 differed from the other four. This effect is likely to have been due to the regulation change.

Analysis was then focused on the proportion of braking or stopping vehicles. However, only those encounters between car drivers and pedestrians in which a pedestrian was standing and

waiting at the edge of the road were analyzed. This was done in the interests of better comparability of the results. The proportion of encounters in which a vehicle stopped or braked rose between observation sessions 1 and 3 from an initial 12.5 per cent to 29.8 per cent and 46.3 per cent, and then dropped in sessions 4 and 5 to 34.9 per cent and 31.6 per cent, respectively. This effect is highly significant (chi-square = 67.2, df = 4, p = .000).

The high level of significance is largely due to the difference between the results obtained in observation session 1 and the results from the other four sessions. Nevertheless, the decline in readiness to stop which was evident in observation sessions 4 and 5 must be considered the critical region. Moreover, one cannot exclude the possibility that there was a certain coincidental nature about the increased readiness to stop shown in session 3. The willingness to stop seems to have stabilized at a level of approximately 30 per cent.

The only remaining question is whether the car drivers stopped voluntarily or were forced to do so by the behaviour of the pedestrians. The proportion of encounters in which the car drivers were forced to brake because a pedestrian was already in the road has not changed significantly (p = .30), even if there was a numerical reduction in such conflicts (from 43.9 per cent to approx. 30 per cent).

2.5. CONCLUSIONS

One can deduce from this study that the change in the law concerning behaviour at pedestrian crossings, has led to changes, especially on the part of car drivers. The proportion of pedestrians who wait at the edge of the pavement has hardly changed. On the other hand, the average number of vehicles who drive past waiting pedestrians before they can cross the road has dropped from 2.6 to 1.5. The proportion of cases in which a car stopped to allow a pedestrian to cross the road rose from 12.5 per cent before the introduction of the new regulation to 29.8 per cent, 46.3 per cent, 34.9 per cent and, finally, 31.6 per cent one year after its introduction. The analyses show that the position of the pedestrian has been improved by the change in the law, and that a proportion of car drivers indeed observe the new regulations.

2.6. APPENDIX

Observation of pedestrians crossing the road

General information		
Identification number of researcher		
Number of subject		
Time (hour)		

Observations			
Sex		male	
		female	
Approximate age	young child	(< 9)	
	older child	(10 – 14)	
	young person	(14 – 18)	
	young adult	(18 – 30)	
	young middle-aged	(30 – 44)	
	old middle-aged	(45 – 60)	
	elderly	(> 60)	
Pedestrian stops (feet alongside each other)		no	
		yes	
If yes, number of cars which fail to stop (slashes or number)			
Car that decelerates or stops		no	
		yes	
If yes, was the pedestrian already on the road when the car started to decelerate?		no	
		yes	