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TRAFFIC ACCIDENTS INVOLVING CHILDREN

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In 1977 over 1200 children under the age of fifteen years were killed or injured in traffic accidents in South Australia. ~~Thirty one~~ <sup>29</sup> of these children sustained fatal injuries (Table 1). Just over half of these children were passengers in motor vehicles, excluding motor cycles, about one quarter were pedestrians and a further one fifth were pedal cyclists.

As the children who were passengers played no role in the causation of the accidents in which they were involved, apart from the isolated exceptional case, the first part of this paper will deal with a review of common factors in the causation of pedestrian and pedal cycle accidents involving children. The second part of the paper will deal with the causation and possibilities for prevention of the injuries which were sustained by these children, whether they be pedestrians, cyclists or passengers in cars.

## THE CAUSATION AND PREVENTION OF TRAFFIC ACCIDENTS INVOLVING CHILDREN

### Pedestrian Accidents

The characteristic accident involving a child pedestrian is one in which the child runs on to the roadway, often from behind a parked car. In our recent in-depth study of road accidents in metropolitan Adelaide 77 per cent of the child pedestrians ran onto the road. This percentage was more than five times greater than that for the adult pedestrians who were commonly struck when walking through banked-up traffic or when standing in the centre of the road. Pedestrian accidents involving children generally occur in daylight, simply because that is when children are most likely to be on the roads, and so general visibility is usually quite good. Nevertheless a driver has very little warning, in most cases,

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TABLE 1: CHILD CASUALTIES IN TRAFFIC ACCIDENTS BY  
TYPE OF ROAD USER\*

Severity of Injury	Type of Road User				Total
	Pedestrian	Pedal Cyclist	Passenger in Motor Vehicle	Other	
Fatal	9	4	16	-	29
Non-Fatal	284	244	646	24	1198
All Casualties	293 <i>27%</i>	248 <i>20%</i>	662 <i>55%</i>	24	1227

\* South Australia, 1977. Source: Road Traffic Board.

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that a child is about to run onto the road, particularly when a parked vehicle prevents the driver from seeing the child until the very last moment. In most of the accidents which our Unit has investigated there was very little that the driver could have done to have avoided hitting the child. On a divided road where there is more than one lane available for traffic it is likely that a driver will have some chance, albeit small, of avoiding a child who runs from behind a parked car, or at least be able to slow his car down before hitting the child, if he chooses to travel in a right hand lane rather than in the left hand lane adjacent to the parked vehicles. Under such circumstances the requirement that a motorist should keep to the left on a multi-lane road may in fact increase the risk of a collision with a child pedestrian.

If young children could be taught to take greater care when crossing roads, or when playing near a road, then the frequency of their involvement in pedestrian accidents obviously would be greatly reduced. While there is doubtless much that can be done to educate children in road safety practices there are reasons to believe that the degree of skill required to assess the traffic situation and then to decide that it is safe to cross the road may often be beyond the capacities of the young child, or even many adults at some locations on arterial roads. This implies the need for constant supervision of young children in the traffic environment, a need which is reinforced by the apparently impulsive behaviour which is demonstrated by the child running on to the roadway, usually without first looking to see if it is safe to do so.

In general it may be noted that the measures which appear likely to assist the adult pedestrian to cross a road safely, such as the provision of median strips or median refuges, are unlikely to have a significant effect in reducing the incidence of pedestrian accidents

involving children. Consequently every effort should be made to ensure that the severity of such collisions is minimized, and one way in which this may be able to be achieved is a reduction of the urban area speed limit from 60 k.p.h. to 50 k.p.h. As noted above, the driver frequently has very little warning that a child is about to run out in front of his vehicle, and it is unlikely that a 10 k.p.h. reduction in the speed limit, if observed, would make a very great difference to the incidence of accidents involving the child pedestrian, but such a speed reduction may make a significant difference to the severity of the injuries inflicted on a child when hit by a car.

#### Pedal Cycle Accidents

In a manner which is analogous to the impulsive behaviour of the child pedestrian, child cyclists are frequently involved in collisions with motor vehicles when they turn across the road without first looking behind them to check that it is safe and that the way is clear. Again most of these accidents occur in daylight, reflecting once more those times at which the child cyclist is most commonly exposed to risk. Associated with this impulsive behaviour on the part of the child cyclist is a common failure to observe the traffic rules.

The possibilities for the prevention of accidents of this type are not encouraging. Education may help the young cyclist to become aware of some of the hazards which are inherent in riding a cycle on the roads but, as with the child pedestrian, it is doubtful whether even the best educational programme will have a significant effect on the frequency with which the child cyclist reacts in an impulsive manner. The nature of this activity is such that supervision of the cyclist is rarely possible.

Because many of these accidents resulted from the cyclist turning right from a position near the left hand kerb, only to be struck by an

overtaking vehicle, it may be that a requirement for cycles to be fitted with at least one rear vision mirror on the right hand side could have some effect on the frequency of accidents of this type, although the same doubt exists as to whether the young cyclist would bother to look into a rear vision mirror if, as appears to be the case at present, he or she turns without first looking behind them for approaching traffic.

It appears reasonable to assume that, wherever possible, the provision of separate cycle paths should be an effective way of minimizing the frequency of accidents to cyclists of all ages.

## THE CAUSATION AND PREVENTION OF INJURIES TO CHILDREN IN TRAFFIC ACCIDENTS

### The Child Pedestrian

The common conception of a pedestrian being run over by a car is incorrect for the adult, who is run under, and it is rarely accurate even for the child pedestrian who is more likely to be knocked forwards and out of the path of the striking vehicle.

The child pedestrian's injuries can be attributed to the direct initial impact by the front of the striking vehicle, and to the subsequent impact with the road surface. Head injuries are the most common consequence of both the impact by the car and the subsequent impact which results from being thrown to the surface of the road. There is little that can be done to reduce the severity of this second impact, apart from attempting to minimize the speed of the striking vehicle. There is, however, a great deal which could be done to modify the design of the front of the car.

Much has been achieved over the past fifteen years in the protection of a car occupant from injury when striking the interior of the vehicle, or even in preventing such contacts by means of the provision of seat belts,

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for example. Unfortunately those road users who are struck by the exterior of a passenger car are still exposed to impacts which are needlessly severe. With few exceptions there is little evidence that the frontal design of current model cars has incorporated current knowledge of ways in which the injuries inflicted on a pedestrian might be minimized.

### The Child Pedal Cyclist

When the child cyclist also receives injuries from the initial impact by the striking vehicle and then from being thrown to the road surface, the injuries sustained in the initial impact tend to be concentrated on the legs and pelvis, with the serious head injuries resulting mainly from contact with the road surface. Nevertheless, the remarks made about vehicle design in the preceding section apply equally to the reduction of the severity of injuries sustained by pedal cyclists. Unlike the pedestrian, however, it is reasonable to recommend that the pedal cyclist wear some form of crash helmet. This is unquestionably a matter which is deserving of considerable effort in both publicising the types, availability, and probable level of protection afforded by existing helmets, and in encouraging cyclists to wear them. An appropriate place at which such encouragement might be introduced is in the school setting. Not so long ago many schools required students to wear their school cap or hat when travelling to or from school. While such measures may have done much for the appearance of the child, a campaign aimed at encouraging those who cycle to school to wear a crash helmet could save their lives.

### Children in Cars

A child passenger in a car is safest when adequately restrained. The appropriate type of restraint depends on the age and stature of the child and ranges from the common bassinet, suitably located, to the adult

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S<sub>6</sub>, S<sub>7</sub>  
S<sub>8</sub>

seat belt for the older child. In the absence of a suitable form of restraint it is far safer for the unrestrained child to travel in the back seat, preferably not standing between the front bucket seats where there is little to protect them from being thrown forwards in a frontal collision. There are now approved restraining devices for children of all ages beyond infancy and once again this is likely to be an area which would amply repay extensive advertising of the types and availability of these devices and of the benefits to the child which can result from the provision of such protection.

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Unfortunately, carrying an infant in a bassinet is not completely satisfactory from the safety viewpoint, although it is greatly to be preferred to carrying the child on the mother's lap, for example, or lying on the seat whether it be in the front or the back. Wherever possible a bassinet should be located on the floor behind the front seat. If that is not possible, it should be placed on the back seat but with the child's head close to the centre of the car and with some stout cushions or bolsters placed at either end of the bassinet to protect the child to some degree in the event of a severe side impact. If a seat belt can be strapped around the bassinet that, too, is an advantage in protecting the child in the event of a collision.

#### CONCLUSION

The involvement of child pedestrians and pedal cyclists in traffic accidents is commonly a consequence of the child behaving in an impulsive, and careless, manner. Direct supervision may have some effect in preventing this type of behaviour, but that is not always practicable with the child pedestrian and is rarely so for the child cyclist. Education in traffic



safety is desirable, but is unlikely to result in a significant reduction in the frequency of accidents which result from impulsive behaviour. The provision of a safer environment, difficult though it may be to effect in established areas, could be expected to reduce the involvement of children, and adults, in pedestrian and cycle accidents.

This difficulty in preventing children from being involved in accidents as pedestrians and cyclists emphasises the need to try to reduce the severity of such collisions. Two ways in which this might be achieved are by the modification, at the initial design stage, of the fronts of passenger cars, and by a reduction in the urban area speed limit.

The protection of children as passengers in cars depends largely on the availability and use of approved restraining devices. While a wide range of approved child restraints are on the market much can still be done to increase the ease with which a child can be adequately protected when travelling in a car.