

**Impact case study (REF3b)**

<p><b>Institution:</b> University of Lincoln</p>
<p><b>Unit of Assessment:</b> 4 – Psychology</p>
<p><b>Title of case study:</b></p> <p>Beyond The Green Cross Code: Cognitive and Social Influences On Child And Adolescent Road Safety</p>
<p><b>1. Summary of the impact</b></p> <p>Road traffic collisions are a major cause of mortality and morbidity in children and young people globally (World Health Organisation report on child injury prevention, 2008). Research into child and adolescent road crossing behaviour, led by Dr Karen Pfeffer of the Evolution and Development Research Group at the University of Lincoln, has influenced road safety intervention practice via its inclusion in a series of safety initiatives, programmes and guides for parents, health-care providers, educators and road safety officers, produced by independent organisations internationally since 2008. Dr Pfeffer’s research has also had international impact and influence via her appointment as a mentor for the World Health Organization (WHO) Mentors for Violence and Injury Prevention programme.</p>
<p><b>2. Underpinning research</b></p> <p>The research underpinning the impact investigated the role of attention and cognitive processes in children’s road crossing decisions, and the role of social context in road crossing behaviour. Computer based tests of the influence of selective attention during viewing of road traffic scenes, combined with standardized neuropsychological tests, assessed the relationship between the development of cognitive processes and the ability to identify safe crossing points<sup>1,2</sup>. Naturalistic observation of adults’ and childrens’ road crossing behaviour was used to investigate the influence of social context<sup>3</sup>. Video simulations of road traffic scenes presented to adolescents and their friends were used to investigate peer influence on decision making<sup>5</sup>. The research was carried out between 2003 and 2013. The principal investigator was Dr Karen Pfeffer, and a key co-investigator in the research was Dr Zahra Tabibi, who was a PhD student at the University of Lincoln.</p> <p>Key insights of the research were:</p> <ul style="list-style-type: none"> <li>• selective attention, divided attention, and the ability to inhibit distracting information are required for identifying safe crossing sites quickly and accurately. Young childrens’ attention is especially affected by distracting information when choosing a safe place to cross<sup>1,2</sup>;</li> <li>• development of cognitive processes, particularly information processing speed, is an important predictor of a child’s ability to identify safe road crossing sites<sup>4</sup>;</li> <li>• adults provide implicit rather than explicit road safety guidance for children when crossing roads. They act as good role models for children, but only infrequently take the opportunity to explicitly teach road safety in situ<sup>3</sup>;</li> <li>• adults behave differently towards girls and boys in road crossing contexts; specifically they behave more safely when with girls than boys<sup>3</sup>;</li> <li>• adolescents’ road safety behaviour can be modulated positively and negatively by peer influences<sup>5</sup>.</li> </ul> <p>Conclusions and recommendations arising from the research program to date are:</p> <ul style="list-style-type: none"> <li>• road safety training programs for children should take into account the development of children’s attention capabilities;</li> <li>• interventions aimed at reducing child road casualties should encourage parents to teach road-crossing skills directly, and should take into consideration differences in adult supervision of girls and boys.</li> </ul>

### 3. References to the research

1. Tabibi, Z., & Pfeffer, K. (2003) 'Choosing a safe place to cross the road: the relationship between attention and identification of safe and dangerous road crossing sites', *Child Care Health and Development*, 29(4): 237-244.
2. Tabibi, Z., & Pfeffer, K. (2007) 'Finding a safe place to cross the road: the effect of distractors and the role of attention in children's identification of safe and dangerous road-crossing sites', *Infant and Child Development*, 16(2): 193-206.
3. Pfeffer, K., Fagbemi, H.P., & Stennet, S. (2010) 'Adult pedestrian behavior when accompanying children on the route to school', *Traffic Injury Prevention*, 11: 188-193.
4. Tabibi, Z., Pfeffer, K. & Sharif, J.T. (2012) 'The influence of demographic factors, processing speed and short-term memory on Iranian children's pedestrian skills', *Accident Analysis & Prevention*, 47: 87-93.
5. Pfeffer, K & Hunter E (2013) 'The effects of peer influence on adolescent pedestrian road-crossing decisions', *Traffic Injury Prevention*, 14: 434-440.

### 4. Details of the impact

The research findings and conclusions have been included in a series of child pedestrian road safety guidance documents aimed at members of the public and professionals, and have influenced the implementation of pedestrian safety programs internationally. The efficacy of one US-wide accident prevention initiative, which drew on the research programme, has recently been positively evaluated as reducing childhood road accident injuries by an independent peer reviewed cluster control research study<sup>a,b</sup>. The research has also led to the principal investigator being invited to act as advisor for international (Ghana) and local (UK, Lincolnshire Road Safety Partnership) road safety programs.

The US Safe Routes to School (SRTS) programme's guide for parents and caregivers, *Teaching Children to Walk Safely as they Grow and Develop*, highlights Tabibi and Pfeffer's findings regarding the limitations of children's attentional skills when finding a safe place to cross. The Safe Routes to Schools Program is a Federal-Aid programme of the US Department of Transportation's Federal Highway Administration (FHWA). The *Teaching Children to Walk Safely* guide is made available via the US National Center for Safe Routes to School<sup>a</sup> at the University of North Carolina's Highway Safety Research Center. A recent independent evaluation of the effectiveness of the US Safe Routes to School programme in New York City found that implementation of the program resulted in a 33% reduction in school-aged children's pedestrian injuries. The rate of school-aged pedestrian injury during school-travel hours decreased by 44% in the post-intervention period (2009-2010) relative to the pre-intervention period (2001-2008) in the districts where the programme had been implemented. In districts where the programme had not been implemented the injury rates were unchanged<sup>b</sup>.

Tabibi and Pfeffer's research is cited as an influence on the development of another empirically validated road safety training package developed by the Monash University Accident Research Centre, Australia. This programme emphasises limitations in children's cognitive capacities as a risk factor for child pedestrian collisions. A case-control group evaluation of this computer simulation based training programme in 71 children found it to be effective in reducing critically incorrect road crossing decisions, with no accompanying reduction in missed opportunities for safe crossing in the treatment group<sup>c</sup>. Cognitive performance measures (e.g. colour trails task) were also found to modulate the effect of the training intervention with children who scored lower on cognitive assessments benefiting more from training.

Tabibi and Pfeffer's research has also formed the basis of another widely available online road safety guide for parents called *Teach Your Children to be Safe Pedestrians*. The guide is distributed via the EBSCO health library (an evidence based information website designed to deliver the best-available evidence based information directly to clinicians and health professionals). It is also available in both English and Spanish versions via over 100 hospital websites, including, for example, the Aspen Medical Centre Denver, Tufts Medical Centre, Boston,

## Impact case study (REF3b)

and the New York University Medical School Langone Medical Centre<sup>d</sup>.

The research findings regarding adult behaviour when accompanying children to school are cited by the US National Highway Traffic Safety Administration guide for State Highway Safety Officers, *Countermeasures that work*<sup>e</sup>. This effective countermeasures guide for policy makers emphasises the importance of cultural and social norms for roadside behaviour in its recommendations for evidence-based adult supervision countermeasures.

Tabibi and Pfeffer's research on children's attention has been widely cited in many other road safety planning reports, research reviews and educational materials, including the UK Department for Transport Research Reports,<sup>f</sup> and is also cited in a number of best-selling developmental psychology textbooks<sup>g</sup>. The research has also been cited by the *Children in Wales* Child Accident Prevention Practice and Information Exchange scheme, and Le Programme intercantonal de prévention des accidents d'enfants, Switzerland<sup>h</sup>.

Further evidence of the impact and influence of Dr Pfeffer's research on pedestrian safety are her advisory duties for international and local non-academic organisations. As a result of her research on childhood road safety, she was selected and appointed to serve as an international mentor for the World Health Organisation Mentors for Violence and Injury Prevention program (WHO MENTOR-VIP) from 2007-2008<sup>i</sup>. The role of the international mentor was to provide guidance and support to a professional working in a low-income country on a specific project.

Following on from this work, Dr Pfeffer was invited by the coordinator of the WHO MENTOR-VIP programme to contribute to a symposium at the Safety 2010 World Conference in London about the mentoring experience, to showcase successful mentoring relationships and to encourage the development of future mentoring partnerships among professionals and researchers in the field of violence and injury prevention<sup>j</sup>. Locally, she was also commissioned to evaluate the '2 fast 2soon' road safety education programme for young drivers (17–24 year-olds) by the Lincolnshire Road Safety Partnership. The Lincolnshire Road Safety Partnership's '2fast2soon' programme won the Prince Michael of Kent International Road Safety Award in 2010, and continues to be offered to young drivers in Lincolnshire.

## 5. Sources to corroborate the impact

- a. *The Safe Routes to School parent guide: 'Teaching Children to Walk Safely as they Grow and Develop'* National Center for Safe Routes to School, University of North Carolina, 2009. [www.saferoutesinfo.org/sites/default/files/TeachingChildrentoWalkSafely.pdf](http://www.saferoutesinfo.org/sites/default/files/TeachingChildrentoWalkSafely.pdf).
- b. *Evaluation of Safe Routes to School programme*: DiMaggio, C. and Guohua, L. (2013). Effectiveness of a Safe Routes to School program in preventing school-aged pedestrian injury. *Pediatrics*, 131(2): 290-296.
- c. *Monash University pedestrian safety training package for children*: Congui, M., Whelan, M, Oxley, J., Charlton, J., D'Elia, A. and Muir, C. (2008) 'Child Pedestrians: Factors associated with ability to cross roads safely and development of a training package', Monash University Accident Research Centre, Report no. 283. [www.monash.edu.au/miri/research/reports/muarc283.pdf](http://www.monash.edu.au/miri/research/reports/muarc283.pdf).
- d. *The 'Teach Your Children to be Safe Pedestrians' guide available via*:
  - Ebsco Health Library*: [healthlibrary.epnet.com/GetContent.aspx?token=a4c1f00b-d245-44f2-a90e-20b047f84a6a&chunkid=28022](http://healthlibrary.epnet.com/GetContent.aspx?token=a4c1f00b-d245-44f2-a90e-20b047f84a6a&chunkid=28022)).
  - Aspen Medical Centre*: [aspenmedgroup.org/your-health/?/28022///sp](http://aspenmedgroup.org/your-health/?/28022///sp).
  - Tufts Medical Centre*: [www.tufts-nemc.org/apps/HealthGate/Article.aspx?chunkid=28022](http://www.tufts-nemc.org/apps/HealthGate/Article.aspx?chunkid=28022).
  - New York University Medical School*: [www.med.nyu.edu/content?ChunkIID=125753](http://www.med.nyu.edu/content?ChunkIID=125753).
- e. *The US National Highway Traffic Safety Administration 2012 guide for State Highway Safety Officers: 'Countermeasures that work'*: [www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf](http://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf).
- f. *UK Department of Transport Research Report*: Cattan, M., Green, J., Newell, C., Ayrton, R., and Walker, J. (2008), 'Child Parent interaction in relation to Road Safety Education Part 1:

## Impact case study (REF3b)

Critical Literature Review', Road Safety Research Report 101, Department for Transport, London.

[webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme1/no101roadsafetyreport.pdf](http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme1/no101roadsafetyreport.pdf).

g. Significant text book citations:

Berk, L. (2009) *Child Development: international edition*, Boston: MA, Pearson Education (8<sup>th</sup> edition).

Berk, L. (2010) *Exploring lifespan development, international edition*, Boston: MA, Pearson Education (2<sup>nd</sup> edition).

Berk, L. (2012) *Infants and children: prenatal through middle childhood, international edition*, Boston: MA, Pearson Education (7th edition).

h. *The 'Children in Wales' e-briefing (April, 2010) for the CHAPPIE network (Child Accident Prevention Practice and Information Exchange):*

[www.childreninwales.org.uk/areasofwork/childsafety/chappie/index.html](http://www.childreninwales.org.uk/areasofwork/childsafety/chappie/index.html); *Swiss local government information website aimed at parents of young children: Le Programme inter-cantonal de prévention des accidents d'enfants (PIPAD'ES)*, Switzerland: [www.pipades.ch/?tag=chemin-de-lecole](http://www.pipades.ch/?tag=chemin-de-lecole).

i. Description and contact details for WHO MENTOR VIP programme:

[www.who.int/violence\\_injury\\_prevention/capacitybuilding/mentor\\_vip/en/](http://www.who.int/violence_injury_prevention/capacitybuilding/mentor_vip/en/).

j. Pfeffer, K. (2010) 'Maintaining mentorship across disciplines and across cultures', WHO MENTOR-VIP: Perspectives on Distance Mentoring for Injury and Violence Prevention, invited panel presentation at the Safety 2010 World Conference, London.