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| <p><b>Institution:</b> University of Lincoln</p>   |
| <p><b>Unit of Assessment:</b> 4 – Psychology</p>   |
| <p><b>Title of case study:</b> The Blue Dog Project: Preventing Dog Bites in Children</p>  |
| <p><b>1. Summary of the impact</b></p> <p>We have carried out research into children’s perception and behaviour around dogs, which has led to the development of an effective safety training programme, as well as improving public understanding of child-dog interactions and risk contexts for dog bite injury in children. The ‘Blue Dog’ (BD – www.thebluedog.org) project has led to changed educational and veterinary practice, public policy change and animal welfare benefits internationally. A key part of the project was the development and validation of an interactive DVD, with training tools that teach children how to be safe around dogs. The results of the research were integrated into the injury prevention messages disseminated by the BD project. The research programme has received publicity worldwide, and over 80,000 copies of the BD DVD have been distributed to 21 different countries, with the accompanying BD booklet translated into 17 different languages. The research was carried out from 2005 onwards, with the impact of the research accruing from 2008 to date.</p> <p><b>2. Underpinning research</b></p> <p>The research programme aimed to understand what aspects of children’s behaviour and perception make them vulnerable to dog bites, and assessed whether effective dog bite prevention tools could be used to reduce risk of dog bites, leading to the development and evaluation of the Blue Dog DVD. Key staff involved in the research were: Professor Kerstin Meints (KM), project leader and director of the Lincoln Baby Lab; research assistants Sophie Hall, Charlotte Hall, Corinne Szyrnk, and Victoria Brelsford, and research fellow Nelly Lakestani; Tiny De Keuster, Visiting Research Fellow at the University of Lincoln, veterinarian, and, since 2012, part-time Professor of Veterinary Science at the University of Ghent, acted as consultant.</p> <p>The research had 4 main components:</p> <ul style="list-style-type: none"> <li>• investigating intrusive ‘leaning in’ behaviour as a contribution to facial dog bites in young children;</li> <li>• the misinterpretation of dogs’ facial expressions by children;</li> <li>• the design and empirical evaluation of a dog bite prevention tool for children under 7;</li> <li>• assessing and teaching children and parents understanding of dogs’ body language.</li> </ul> <p>We were the first to report <i>children’s intrusive leaning-in behaviour</i> as a potential trigger for dog bites. We used video-monitoring under controlled experimental conditions to test if children aged 3 to 5 show more leaning-in with animate, inanimate, novel, familiar, moving or static objects of different smells, presented at different heights. Children were found to show significantly more intrusive leaning-in behaviour with moving or novel stimuli<sup>1</sup>. We concluded that parents need to be aware of children’s tendency to intrusively lean-in to animate/novel stimuli, including dogs. The research was funded by a grant from the Waltham Foundation (external peer-reviewed grant of £7,533, 2008-2009, awarded to KM).</p> <p>A further series of studies examined <i>how children read human and canine faces of different emotional expression</i><sup>2,3</sup>. We showed children aged 3 to 7 years images of happy, neutral and angry human and dog faces, and asked them to name the emotion portrayed in the picture (supported by a University of Lincoln internal research award to KM, 2009-2010). Children were found to misinterpret angry dog faces, with 69% of 4 year-olds interpreting aggressive dog faces as ‘smiling’ and ‘happy’<sup>3</sup>. It was concluded that parents and dog owners need to be aware of children’s tendency to misinterpret dogs’ emotions, and that children would benefit from training to correctly identify dog emotional signals.</p> <p>Most recently, we have <i>assessed</i> children and parents ability to read dogs’ emotions from dynamic images. This research is funded by the US National Institute of Child Health (2 year peer reviewed grant of \$99,824, awarded to KM in 2012). Even when viewing videos of growling dogs children are still found to report the dogs as being happy and smiling – the younger the children,</p> |

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the more frequent the mistakes (65% of 3 year-olds and 52% of 4 and 5 year-olds think angry dogs are happy)<sup>4</sup>.

Development and evaluation of the BD DVD was funded by the Federation of European Companion Animal Veterinary Associations and a Dutch Groep Geneeskunde Gezelschapsdieren award (grant of £20,137, 2005-2006, awarded to KM)<sup>5,6</sup>. Ninety-six Children aged 3 to 6 years viewed a series of cartoons and stories depicting interactions between children and the dog 'Blue', including scenarios depicting aspects of childrens' behaviour and perception identified by the research programme (e.g. leaning into a dogs face; stroking an angry dog).

### 3. References to the research

1. Meints, K., Syrnyk, C. and De Keuster, T. (2010) 'Why do children get bitten in the face?', Proceedings of the 10th World Conference on Injury Prevention and Safety Promotion, 21-24 September, London, UK, *Injury Prevention*, 16, suppl 1, A172.
2. Racca, A., Guo, K., Meints, K. and Mills, K. (2011) 'Reading faces: differential lateral gaze bias inprocessing canine and human facial expressions in dogs and 4-year-old children', *PLOS ONE*, 7(4): e36076.
3. Meints, K., Racca, A. and Hickey, N. (2010). 'How to prevent dog bite injuries? Children misinterpret dogs' facial expressions', Proceedings of the 10th World Conference on Injury Prevention and Safety Promotion, 21-24 September, London, UK, *Injury Prevention*, 16, suppl 1, A68.
4. Racca A, Meints K. and Hickley, N. (2013) 'Is the Dog Smiling? Children from 4-7 Years Misinterpret Dogs' Facial Expressions, Society for Research in Child Development Biennial Meeting, Seattle, USA, 18-20 April.
5. Meints, K. and de Keuster, T. (2009) 'Don't Kiss a Sleeping Dog: The First Assessment of "The Blue Dog" Bite Prevention Program', *Journal of Pediatric Psychology*, 34(10), pp. 1084-1090 doi: 10.1093/jpepsy/jsp053.
6. Meints, K., De Keuster, T. and Lakestani, N. (2010) 'Children and dogs: How the "Blue Dog" can help to prevent dog bite injuries', Proceedings of the Canine Science Forum, 25-28 July, Vienna Austria, p. 140.

### 4. Details of the impact

Dog bites account for tens of millions of injuries annually, with the highest risk occurring amongst children (World Health Organisation data). In the UK, dog bite injuries accounted for 6,450 hospital admissions in 2012 (16% of which were children), and cost the NHS around £3.3million per year (Health and Social Care Information Centre; DEFRA).

A research programme carried out at the University of Lincoln, drawing on the knowledge, expertise, skills and facilities in the Lincoln Baby Lab and Evolution and Development research group, led to the creation, development and assessment of an effective evidence-based tool for dog bite prevention (the BD DVD and booklet), which has had international impact on veterinary practice and injury prevention policy, enhancing the health and wellbeing of children and dogs and improving public understanding of the risk factors associated with dog bite injury. Other beneficiaries include parents, teachers, veterinarians and dog trainers. The research programme has generated impact of local, national and international reach.

Assessment of the effectiveness of the BD DVD was carried out via questions about additional example scenarios which probed children's knowledge before and after training. Children were found to show significant learning about safe behaviour around dogs immediately after training and for up to a year afterwards<sup>a,b</sup>. Parent questionnaire assessments indicated that 48% of parents stated that their children behaved more safely with dogs in general as a result of the training, and 38% said their children behaved more safely around their own dog. In addition to the evaluations carried out at the University of Lincoln, a recent independent randomised controlled study has confirmed a significant improvement in childrens' ability to recognise dog bite risk factors following BD training relative to exposure to a control computerised training task (fire safety training)<sup>c</sup>.

## Impact case study (REF3b)

Following successful evaluation of the efficacy of the tool, over 80,000 copies of the BD DVD and booklet have been distributed to 21 different countries, with the accompanying BD booklet translated into 17 different languages. The German Veterinary Association (GVA), German Federal Chamber of Veterinarians, the Federation of European Companion Animal Veterinary Associations (FECAVA) and the American Veterinary Association all officially recommend the BD DVD as a dog bite prevention tool<sup>d</sup>. Rabies is a significant health concern following dog bite injuries internationally, and the Global Alliance for Rabies Control report recently recommended BD for use as part of rabies education and prevention programmes<sup>e</sup>.

Schools and nurseries in the UK and abroad are using the BD DVD and booklet as part of health and safety education<sup>f</sup>. For example, the Munich municipality, in cooperation with GVA, has used the Blue Dog DVD as an injury prevention programme in nurseries since 2009<sup>g</sup>. In Belgium, education policy has specified the application of the BD in schools, and the BD is included as part of the leading Belgian teachers' handbook and education programmes sponsored by the government of Vlaams Brabant<sup>h</sup>.

Examples of the impact of the BD project at a national level within the UK are its recommendation by the National Health Service Choices website (the 'online front door to the NHS')<sup>i</sup>, and its use by the Dogs for the Disabled charity in The National Autistic Society and University of Lincoln's lottery-funded project, 'Parent Autism Workshop and Support' (PAWS). Significant impact has also occurred on a local scale via the use of the BD DVD in nurseries, Sure Start Centres and schools in Lincolnshire. The BD DVD is used by social workers and dog trainers at *Pet Respect* in and around Hull, working with underprivileged families and young offenders. The Dock House Homeless project, Domestic Violence Project, and Humberside Police have all used BD training to enhance understanding and reduce dog bites in children.

Public awareness of childhood dog bite injury risk factors has also been raised by widespread international and national media coverage of the project's research findings. In 2010 the University's dog bite prevention research programme was chosen as one of the three key features to represent the World Safety Conference (London 2010) to the media and public. Other media coverage has included BBC News<sup>l</sup>, Sky News, BBC Look North, TV Prague, Radio 1, Five Live, BBC Radio Scotland, Radio Wales, Radio Teeside, Bay FM, Radio Lincolnshire, Lincs FM, Scientific American, The Guardian, The Telegraph online, The Daily Telegraph, Lancaster Guardian, Lincolnshire Echo, Liverpool Echo, Süddeutsche Zeitung (one of the top 10 Germany-wide daily newspapers)<sup>j</sup>, and Partner Hund (German dog owners magazine).

##### 5. Sources to corroborate the impact

- a. Meints, K. and de Keuster, T. (2009) 'Don't Kiss a Sleeping Dog: The First Assessment of 'The Blue Dog' Bite Prevention Program', *Journal of Pediatric Psychology*, 34(10), pp. 1084-1090, doi: 10.1093/jpepsy/jsp053.
- b. Meints, K., De Keuster, T. and Lakestani, N. (2010) 'Children and dogs: How the 'Blue Dog' can help to prevent dog bite injuries', Proceedings of the Canine Science Forum, 25-28 July, Vienna Austria, p. 140.
- c. Schwebel, D., Morrongiello, B.A., Davis, A.L., Stewart, J., Bell, M. (2012) 'The Blue Dog: Evaluation of an Interactive Software Program to Teach Young Children How to Interact Safely With Dogs', *Journal of Pediatric Psychology*, 37(3), pp. 272-228.
- d. Recommendations from veterinary associations worldwide: German Veterinary Association website: [www.dvg.net/index.php?id=1287](http://www.dvg.net/index.php?id=1287); Federation of European Companion Animal Veterinary Association website: [www.fecava.org/content/fecava-council-meets-birmingham](http://www.fecava.org/content/fecava-council-meets-birmingham); American Veterinary Association website: [www.avma.org/KB/K12/Pages/AVMA-Products-The-Blue-Dog.aspx](http://www.avma.org/KB/K12/Pages/AVMA-Products-The-Blue-Dog.aspx).
- e. *Global Alliance for Rabies Control Report citing Blue Dog programme*: Lembo et al., (2011) 'Renewed Global Partnerships and Redesigned Roadmaps for Rabies Prevention and Control', *Veterinary Medicine International*, Article ID 923149.
- f. *Evidence for BD's use in schools*: [www.thebluedog.org/en/blog/p/category/schools](http://www.thebluedog.org/en/blog/p/category/schools).
- g. *Germany-South Newspaper report on use of Blue Dog in Schools*:

**Impact case study (REF3b)**

[www.sueddeutsche.de/muenchen/kinder-und-hunde-vorsicht-vor-dem-hund-1.158336](http://www.sueddeutsche.de/muenchen/kinder-und-hunde-vorsicht-vor-dem-hund-1.158336).

- h. *Teachers' toolbox pages for BlueDog project:* [www.thebluedog.org/nl/pedagogisch-pakket/pepa-de-blauwe-hond-op-school/pepa-lesplannen](http://www.thebluedog.org/nl/pedagogisch-pakket/pepa-de-blauwe-hond-op-school/pepa-lesplannen).
- i. *NHS Choices Website: NHS endorsement:* [www.nhs.uk/Conditions/Bites-human-and-animal/Pages/Prevention.aspx](http://www.nhs.uk/Conditions/Bites-human-and-animal/Pages/Prevention.aspx).
- j. *BBC News website:* [www.bbc.co.uk/news/health-11382029](http://www.bbc.co.uk/news/health-11382029).