DOG BITES: PERCEPTION AND PREVENTION

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy by Sara Cecylia Owczarczak-Garstecka.

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Abstract

Dog Bites: Perception and Prevention

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Traditional approaches to studying dog bites have predominantly used epidemiological methodology to understand risk factors and prevention centred on education about dogs' body language. Instead, in this project dog bites are explored from the perspective of those directly affected, as a victim or a dog owner. The objectives of this study included understanding how dog bites are perceived and experienced and how the context of individual lived experiences influences these perceptions and practices around dogs. The project also aimed to learn how impact of bites could be reduced.

The project used a mixed research methods approach: a) qualitative methods (in-depth interviews, participant-observations, focus group discussions, and analysis of documents and comments) were used to explore individual experiences and perceptions; b) Statistical analysis of a health and safety database was used to explore patterns of dog bites and remedial actions within occupational contexts.

This research highlights that victims or dog owners (but rarely dogs) were blamed for bites and felt stigmatised due to their experience, which hindered prevention by impacting on their motivation to seek help. Two most common scenarios in which bites at work occurred were: entering or delivering a parcel to a property, or handling dogs in a veterinary practice or dog shelter. In many occupational bite scenarios, dogs were not seen before a bite. Risk in interactions with dogs was identified and managed by drawing on three overlapping strategies: through routines and procedures; emotions and intuition; and trust and sense of responsibility for the dog. At work, the formal, co-dependent procedures for risk management were modified in response to individual experience and relations with colleagues and dogs. Trust was used as a proxy for risk identification, but also paradoxically, led to taking risk in interactions with some dogs. Trustworthiness was assessed by scrutinising a dog's reputation, character or appearance (including breed), performance, and the dog's owner. Most participants believed that the emotional contagion between humans and dogs was a risk as well as a tool for negotiating safety. Risk management was consequently discussed in terms of ability to regulate emotions, and in so doing, controlling one's own body and bodies of dogs. Prevention required practical skills to control dogs, which owners often lacked. Dog bites often had a long-lasting impact on individual physical and mental health.

This research indicates that dog bite prevention requires more than knowledge of dog behaviour: it was embedded within social relations and necessitated co-operation with colleagues or family, and it was shaped by the physical environment in which the interaction took place, social norms, and perceptions of dogs and possibility of preventing bites. While dog bites cannot always be prevented, their impact could be feasibly reduced through provision of muzzles as well as return to work policies, mental health care and social

support which could reduce the long-term damage to the injured person. More broadly, dog bite prevention can be improved by expanding efforts to be more 'system-wide' so that there are multiple opportunities for intervention.

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1. Introduction

1.1 On nature (and culture) of dog bites

"You don't forget a dog bite. It's been more than 20 years now but I've still got a nice scar to remind me. I had three different holes in my leg and I got 17 stitches. Nobody else has forgotten about it either. If it had happened in another game, with less at stake, I don't think I'd still be asked about it now (…) I don't have any grudges it was nobody's fault." Jim McNichol, writing for the Guardian in 2009

Jim McNichol played for Torquay United when a police dog, Bryn, bit him during a 1987 football match. The game was important as Torquay was in the relegation zone. McNichol was a key player and his injury meant the outcome of the game did not look good for Torquay. However, assessing McNichol's injuries took 4 minutes, which gave Torquay United players a chance to recover. Eventually, this was attributed to them winning against Lincoln City. Overnight, Bryn became a local hero (see Figure 1.1).

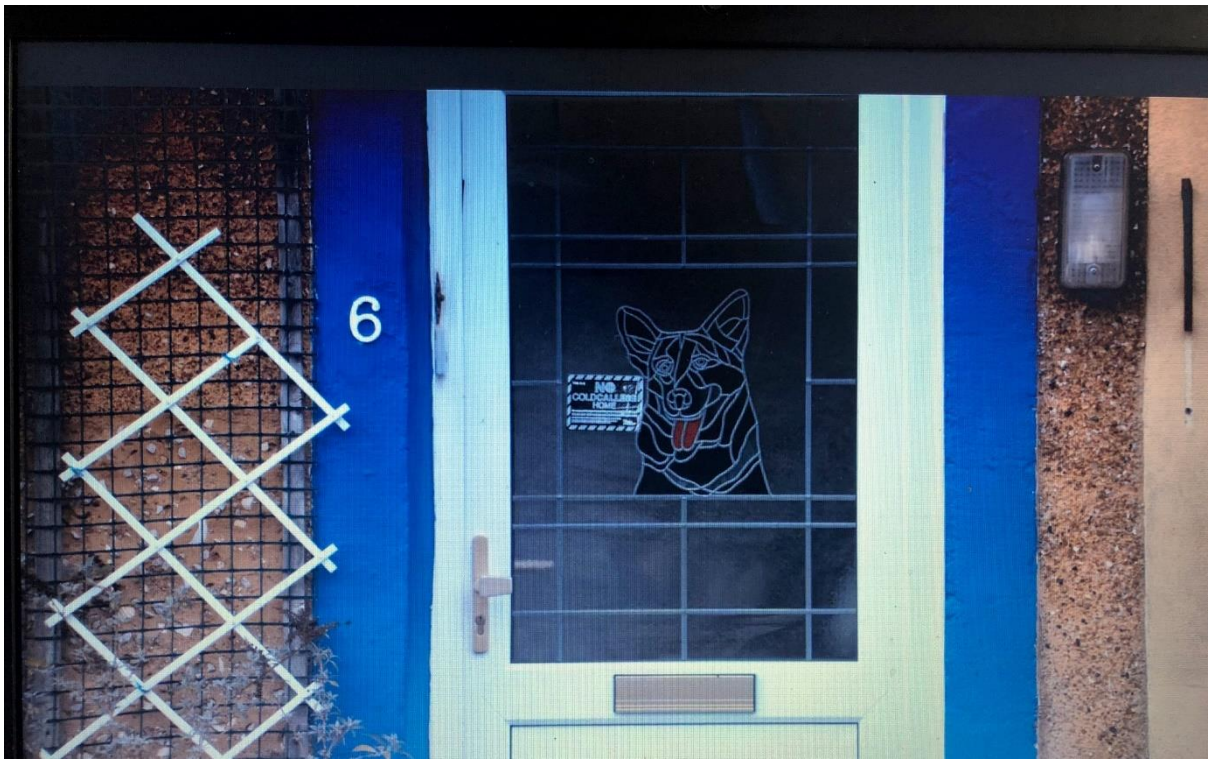


Figure 1.1. *Image of Bryn, the dog who bit Jim McNichol during the 1987 football game. Torquay United fans saw the bite as preventing the team's relegation from the league. In: Losers, Netflix, 2019.*

This story was recently portrayed in Netflix documentary "Losers". In one scene, archival footage shows Bryn being introduced to McNichol a couple of days after the incident. During this interaction the dog looks nervous. Meanwhile, a journalist asks the dog handler: *"He shouldn't have done what he did?"* and the handler explains hesitantly: *"Well…erh… what happened shouldn't have happened, particularly to one of the players. But it was purely accidental the way it did happened".* In the next scene the chairman of Torquay United hands Bryn a huge, meaty bone, as a token of appreciation for saving the game. Bryn is still looking unsure, turning his head away, ears pulled back, panting and with the whites of his eyes glaring. The dog is simultaneously leaning away from the stranger, camera crew and journalists and trying to reach the bone. The chairman then leans over the dog, preventing him from eating the bone, and ties a big Torquay scarf over Bryn's neck, while patting him on the top of the head.

McNichol's story illustrates the broad impact that dog bites can have on dog owners, handlers, victims, observers and dogs. In England and Wales at least 20 people are hospitalized due to being bitten or struck by a dog every day (Winter, 2015). A cross-sectional study of a community of 1280 households in Cheshire, UK reported that ¼ of a studied population were bitten at some point in the past (Westgarth, Brooke, & Christley, 2018). Many of these individuals are bitten in the context of their occupation (Langley, 2012, Lucas et al., 2009, Landercasper et al., 1988, Fritschi et al., 2006); however, the extent of dog bites within an occupational context and methods of their prevention have not been extensively explored in the past. Bites are also reported to be increasing annually (Winter, 2015), which is why research into bite prevention is more pressing now than ever before. At least 48 people have lost their lives in the UK as a result of dog bites between 2005-2015 (ONS, 2015). Children bitten by dogs have also reported adverse mental health effects (Peters et al., 2004). Bites lead to a loss of income for individuals and business due to the employees taking time off sick (Langley, 2012). Dog bites incur a cost to public institutions: for example, kennelling of potentially dangerous dogs was estimated to cost the police £5 million pounds in 2015 (Jones, 2015). A total cost of dog bites to the NHS has been estimated at around £10 million a year (Hall et al., 2016). The cost to society also includes expenses incurred by the courts, and additional costs to an individual (e.g. new clothes) that are difficult to calculate.

Bryn was, unusually, treated as a hero. However, dog bites are a dog welfare problem as they can impact the owner-dog bond causing it to completely breakdown, which may lead to a relinquishment of a dog to a shelter (Miller et al., 1996) or euthanasia (BVA, 2016, Kass et al., 2001). A bite itself may also reflect poor welfare of a dog: dogs that are anxious, fearful or in pain are more likely to bite (Guy et al., 2001, Mills et al., 2012, Blackshaw, 1991).

Dog bites can cause a physical injury and the nature of bites – literally, their tangible, physical impact on human bodies – is usually the focus of research. Bites are often framed primarily as a medical problem (Gandhi et al., 1999; Lee, Santos, & Vyas, 2019; Mannion, Graham, Shepherd, & Greenberg, 2015; Mannion & Mills, 2013; Mannion & Graham, 2016; Pédrono et al., 2016; Touré, Angoulangouli, & Méningaud, 2015) and are attributed to specific factors (most usually dog's breed, e.g. Mannion et al., 2015; Touré et al., 2015). Consequently, bites are described by outlining patterns of victims' and dogs' demographic characteristics and analysing the injuries sustained for bacterial profiles and sequelae (e.g. Mannion et al., 2015; Pédrono et al., 2016). Epidemiological approaches are helpful tools for estimating the prevalence of dog bites within the population and illustrating risk that groups or individuals with specific characteristics may face. What is less clear is why dog bites happen, or what is their social and emotional impact, as illustrated by Bryn and McNichol's story. The social perspective on bites—including their repercussions for the individual, their social relations with family, friends, colleagues, dogs and their environment- is poorly understood.

1.2 Context of the study

1.2.1 Changing welfare of dogs

The current population of dogs in the UK has been estimated at around 9 million, with around twenty-four per cent of UK households keeping one or more dogs (PDSA, 2019b, Murray et al., 2010, PFMA, 2019). A recent PDSA (2018) survey revealed a number of worrying indicators which suggest that the health and wellbeing of UK dogs is deteriorating: 1.4 million dogs (16%) are walked less than once a day; 40% of vets and vet nurses believe that the proportion of obese dogs has increased in the last 2 years and 50% predicted that obesity will be the major factor in dog's health in the future. Further, 82% of owners report that their dogs were fearful of something (e.g. fireworks, vet) and 51% of veterinarians believe that the number of dogs

showing behaviour problems has recently increased (PDSA, 2019b). In addition, nearly a quarter of dogs are left alone for over 5 hours a day (PDSA, 2019b). Given that dogs are social animals, this may have a negative impact on their welfare (Coppinger and Coppinger, 2001). Levels of vaccinations have also shown a dramatic decline: in 2016, 88% of dogs received primary course of vaccinations, in 2019 this figure dropped to 72% (PDSA, 2019a), mirroring patterns observed within the human population (Hussain et al., 2018). The concern over welfare of UK dogs has been further put in the limelight when the UK Kennel Club announced in 2018 that the French Bulldog, a breed which frequently suffers from a range of health problems (Liu et al., 2017, Ladlow et al., 2018, Waters, 2017), rose to take over Labradors as the most common breed in the UK (KCUK, 2018).

1.2.2 Changing relationships with dogs

Dogs were domesticated at least 12,000 years ago (Hare et al., 2002) and dog ownership patterns differ around the world. While in many economically developed countries (EDC) dogs are claimed by an individual owner or family, in for example West Africa, dogs are typically owned by the community or neighbourhood (Coppinger and Coppinger, 2001). The nature of human-dog relationships is also complex: in EDCs dogs are kept primarily as pets, however in South Korea they are kept for their companionship but also as a food source (Podberscek, 2009). In the UK, the relationship with dogs is also changing. Dogs are kept due to both intrinsic motivation for love and companionship and extrinsic motivation as toys, status symbols and accessories (Beverland et al., 2008). Dog owners often objectify dogs but also discuss dogs as a part of family and appreciate them for their unique role as animals (Power, 2008). Although anthropomorphism (i.e. using human characteristics to explain dog behaviour (Horowitz and Bekoff, 2007)) is often criticised (Wynne, 2004), it can strengthen the bond with dogs and promote caring and otherwise beneficial behaviours. Anthropomorphic explanations can however be problematic: dogs could be punished for 'misbehaving' as owners may believe they acted with premeditation (Horowitz, 2009).

Extrinsic motivation for dog ownership contributes to objectification of dogs, i.e. seeing dogs as commodities, and is problematic as it makes dogs disposable when they do not fit with the idealised view of pets (Vänskä, 2016). Objectification is also reflected in choice of breeds, as popularity of breeds reflects prevailing fashion (Ghirlanda et al., 2013, Beverland et al., 2008).

As fashions are temporary and rely on using visual, external markers as symbols of one' character, they objectify relationships with dogs by focusing on their phenotypes instead of the inherent value of a relationship (Ghirlanda et al., 2013). Breed fashions are not a new phenomenon-some breeds were historically used as symbols of social status (Ritvo, 1986). However, currently, the popular breeds are correlated with a range of undesirable behaviours, shorter life expectancy, greater number of genetic disorders, lower trainability, greater fear of other dogs, owner-directed aggression and separation-related problems (Ghirlanda et al., 2013). This suggests that fashion may alter relationships with dogs as the most popular breeds show many of these challenging behaviours. In addition, breed-based objectification shapes perceptions and interactions with dogs in other ways. For instance, where people lack direct experience with bull-breeds, these dogs can be described as dangerous (Clarke et al., 2013, Clarke et al., 2016b), presumably due to how they are represented in the media and in the popular culture. Similarly, due to media representation, people perceive pit bulls to be more aggressive, less friendly and less likely to be rehomed by the prospective adopters than lookalike dogs presented without a breed label (Gunter et al., 2016).

The UK pet market is expected to be worth £7 billion by 2021 (Garcia, 2019). The changing nature of human-dog relationships is also reflected in the growth of the pet business market and the role commodification plays in bonding and interacting with dogs. It has been suggested that dog owners invest in commercial products for dogs to help them express emotions towards their pets and construct an image of an ideal dog companion (Vänskä, 2016,p.79). In this sense, dressing up dogs is a sign of objectification. It is also a tell-tale sign of anthropomorphism as it reflects a popular fantasy of dogs being tame, subordinate beings that can be humanised and fit into manmade life by providing dogs with clothes (Vänskä, 2016). Simultaneously, commodities for dogs became a tool that help humans understand and care for their pets. This can be seen by the increasing popularity of doggy cameras, which record the dog when they are at home alone or the growth of dog translation apps. Dog fashion also emphasises their "petness" rather than their humanity or animality (Vänskä, 2016). It is through these commodities that dogs are constructed as pets that need to be taken care of (Vänskä, 2016). Commodification and the booming pet industry could be argued to represent an example of conspicuous consumption, where high prices and willingness to

spend money are seen to indicate the perceived value of the product (in this case, a dog) (Veblen, 1899/2017). Commodification therefore reflects a new trend in human-dog relationship: the reliance on commodities and material investments (whether in premium food, dog walking leads, dog trainers or even dogs themselves) in fostering a relationship with a dog.

1.2.3 Changing expectations of dogs

Another change in relationships with dogs could be as a result of dogs being the subject of scientific inquiry more often than ever before, as reflected in the rise of publications and research into dog behaviour, cognition and human-dog interactions (Serpell and Barrett, 2016). Potentially, as a result of greater knowledge of dog behaviour and changing expectations of dogs, the dog training industry is a growing. At the same time, the industry is unregulated and there are many disagreements between dog trainers regarding methods used for dog training (Herron et al., 2009).

It is also increasingly recognised that the presence of dogs in society can be beneficial for human health and wellbeing (Wells, 2007), including research into using dogs as therapy animals (e.g. for hospitalised patients), for assistance (e.g. as guide dogs for the blind) and as emotional support animals (Younggren et al., 2016). In all these functions, dogs are seen as helpful, and often can contribute to transforming human wellbeing, again emphasising their special and unique properties. This may shape public perception and expectation of dogs, which may impact on experiences and perceptions of dog bites. There are only a handful of studies where dog bites or dog behaviour problems more broadly were studied within the context of social relationships with dogs (Westgarth and Watkins, 2015, Sanders, 1994, Sanders, 2006, Sanders, 1990). This perspective is vital as relationships with dogs and expectations linked with dog ownership are likely to shape perception of bites and how individuals engage with prevention. Conversely, dog bites may influence perceptions and relationships with dogs as well (Westgarth and Watkins, 2017).

1.2.4 Context of bite prevention

McNichol and the police dog handler both perceived the bite as inevitable and did not think it could have been prevented. However, experts often discuss dog bites as predictable and preventable events (Gandhi et al., 1999, Bernardo et al., 2000, Dixon et al., 2012, Patronek et al., 2013, Sacks et al., 1996).

Dog bites are addressed in the UK by two main methods: education and legislation. Dogs threatening or injuring the public have been punishable by law in the UK since the 1839 Metropolitan Police Act, and the 1871 Dogs Act introduced the power for the police to take a dog from the owner (Clare, 2012). The Dangerous Dogs Act 1991 (DDA) penalizes owners whose dogs are 'dangerously out of control' in public or (more recently) on private property. However, it also bans ownership of certain breeds that are perceived to be more aggressive – Breed Specific Legislation, BSL (Dangerous Dogs Act 1991, 1991). The novel aspect of the 1991 Dangerous Dogs Act was therefore the BSL, as this approach could be perceived in similar terms to a disease eradication strategy, i.e. "extinction of the disease pathogen" (Dowdle, 1998, p.23), a pillar of global public health. If indeed some breeds were more aggressive or causing more severe injury, restricting their numbers would be a sensible approach. Although studies investigating the prevalence of dog bites concluded that BSL or similar legislations was successful in Winnipeg (Canada) (Raghavan et al., 2013), it was not linked with a reduction in a number of dog-related hospital admissions in The Netherlands (Cornelissen and Hopster, 2010), Ireland (Creedon and Súilleabháin, 2017, Ó Súilleabháin and Doherty, 2015), Spain (Rosado et al., 2007), Denmark (Nilson et al., 2018) or England (Klaassen et al., 1996). In addition, breed was not identified as a factor in a systematic review of risk factors for dog bites (Newman et al., 2017a). Dog behavior research suggests that a focus on breed may be erroneous as a review of studies into differences in behaviours between breeds shows inconsistent findings. Within breed differences in behaviour are typically found to be greater than differences between breeds (Mehrkam and Wynne, 2014). The basis of data collected regarding breed differences in aggression is also questionable as the public (and dog-professionals) cannot identify breeds accurately (Hoffman et al., 2014, Gunter et al., 2018, Flint et al., 2017). Moreover, with a few exceptions (De Keuster et al., 2006; Schuler et al. 2008; Cornellisen and Hopster, 2010), studies do not report information about the

popularity of the breed within the study area, therefore breeds that emerge as common in bite records may simply be the most common dogs in the area.

Unsurprisingly, therefore, BSL has attracted a lot of criticism from its inception (McCarthy, 2016). Breed-focused prevention has been described as an attempt to control the social groups linked with dogs perceived as more aggressive (McCarthy, 2016, Mouton et al., 2019). Regardless of its effectiveness, BSL may have contributed to the public perception of dogs. For instance, in Calgary, Canada, where bite reduction occurred without resorting to breed specific legislation, press reports still, discuss bites primarily in terms of dog breed (Mouton et al., 2019). In Ireland, where BSL is in place, bite victims who believe they were bitten by a dog covered by BSL were also more likely to report to hospitals, regardless of severity of bites (Creedon and Súilleabháin, 2017).

The second approach to bite prevention in the UK is based on informal educational campaigns, usually delivered by charities. This approach aims to educate the public about dog body language, under the assumption that a poor understanding of dog behavior leads to greater risk-taking around dogs. Therefore, greater education has been presented as the means of reducing the number of dog bites s (e.g. Dixon et al., 2012, Meints and de Keuster, 2009, Meints et al., 2018, Meints et al., 2010, Lakestani and Donaldson, 2015, Duperrex et al., 2009, Shen et al., 2017, Shen et al., 2016). However, education-based approaches to injury prevention have been criticized for failing to recognize a range of factors which contribute to human behaviour and portraying dog behaviour as easily foreseeable. It is however unclear if dog behaviour can be reliably predicted and if it strictly follows the progressive pattern (often called the ladder of aggression, Figure 1.2) presumed in education approaches. A study where dog behaviours before bites were analysed suggested that only about 20% of dogs showed identifiable aggressive behaviours (Owczarczak-Garstecka et al., 2018).

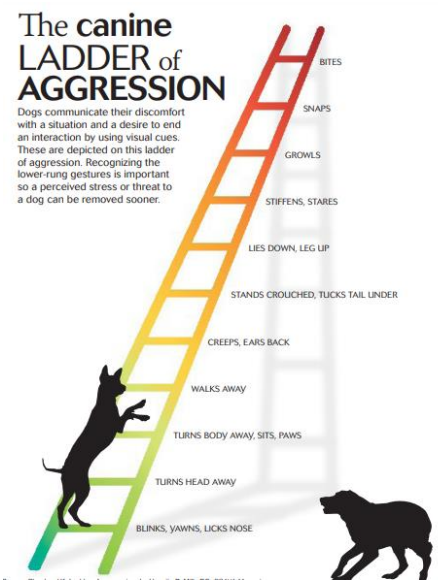


Figure 1.2. *Ladder of aggression. A number of bite prevention programmes aim to teach dog behaviour thought to precede a bite in order to help a person change their behaviour around a dog earlier before it progresses to a bite. Source: Shepherd K. Ladder of aggression. In: Horwitz D, Mills DS. BSAVA Manual of Canine and Feline Behavioural Medicine, 2nd ed. 2009.*

Moreover, human behaviour is not a strict reflection of knowledge. For instance, drivers typically know that seatbelts and adhering to speed limits could improve their outcomes in case of an accident but may still be reluctant to adhere to these measures. Knowledge is just one of many components of behaviour change; skill development and a social and physical environment conducive of change are important as well (e.g. a car fitted with airbags and audio signalling seatbelts not being fastened) (Reason, 1997, Michie and West, 2013, Hemenway, 2009, Dahlgren and Whitehead, 1991). Moreover, research suggests that prevention strategies that rely on individual behaviour change (such as education campaigns) are usually less effective in improving the health of the population than top-down structural strategies (such as change in policy or reformulation of food) (Frieden, 2010, Blankenship et al., 2000, Morrison et al., 2003, Bambra et al., 2010, Reason, 1997). Beliefs regarding effectiveness of treatment or preventive measures affect the compliance as well (Davison et al., 1992, Straughan and Seow, 1998). The story of Jim McNichol and Bryn shows the complexity of perceptions regarding prevention of dog bites. While victims generally do not blame dogs for bites (Westgarth and Watkins, 2015), it is not clear how beliefs about dog bite

prevention itself influences engagement with bite prevention campaigns or affect daily interactions with dogs. Further exploration of approaches to bite prevention, and in particular prevention that goes beyond education, is therefore urgently needed. This thesis aims to fill this gap in knowledge.

1.2.5 Dog bites in Liverpool

Dog bites are perceived as a serious problem within Merseyside and, following high profile dog attacks, the region has been labelled the "dog attack capital of the country" (Taylor, 2015), and one of the reasons why the study was located here. Bite prevention in Liverpool is also seen as a more pressing problem than perhaps elsewhere in the UK. In the course of my research, representatives of the local police, the Royal Mail Group (RMG), and the local branch of the Communication Workers Union (CWU), reported that bites are treated more seriously in Liverpool than in other parts of the country, and that the law on bite prevention is followed more strictly. The interest in bite prevention can also be seen in the formation of the Merseyside Dog Safety Partnership (MDSP, 2019), a partnership between the local councils, police, CWU, RMG, local vets, dog charities and hospitals organised, and led by the University of Liverpool, that aims to co-ordinate bite prevention efforts. These initiatives also mean that Liverpool may be unusual as more dog bites are recorded here than elsewhere, but also there are potentially more efforts to prevent them.

1.3 Positionality and research motivation

McNichol and Bryn's story also helps me to reflect on my own positionality, i.e. the way my background and personal attributes shape this study (Rose, 1997). I was feeling nervous watching this interaction, because of my background in clinical animal behaviour and prior training in reading dog's body language gained while working and volunteering in dog shelters. I construed the subsequent interaction between Bryn and the club's chairman as a near miss and I saw the bite to McNichol as preventable. My affinity for dogs also meant that I felt sorry for the dog, because I interpreted his behaviour as linked with fear or emotional conflict. I was upset with the dog handler, who I thought should have provided guidance to

this interaction. I saw him as responsible for preventing bites and protecting the welfare of his canine partner.

My motivation behind this study, more broadly, was a desire for it to be applicable. As explained earlier, current bite prevention campaigns are based on unproven assumptions and are believed to be ineffective in reducing the number of dog bite related injuries. I was motivated to pursue this research in the hope that the findings can address this problem and lead to an improvement of dog and human welfare and wellbeing. This motivation undoubtedly influenced data collection and analysis and is further discussed as a limitation of this study (in section 10.6).

1.4 Methodological context

This thesis explores dog bites and bite prevention as a social phenomenon. By aiming to propose tangible interventions for health improvements, it contributes to public health perspectives, based on modifying the social and physical environments. Exploring social phenomena lends itself to a qualitative methodology. This will help to explore a range of perceptions and see how bite prevention happens in and through practice, by joining participants in their daily work. However, to understand perceptions of dogs and range of preventive strategies, and to fully appreciate the context and scale of the problem, I will also draw on quantitative and statistical methods of analysis. The thesis does not claim to or aim to present an exhaustive list of attitudes to bites, contexts in which people are bitten or consequences of bites. By recruiting participants based on diversity of experiences related to dog bites, I do hope to characterise a diversity of views and methods for bite prevention used in everyday life.

I will use the social determinants of health model (Dahlgren and Whitehead, 1991, Figure 3) as a scaffolding for the description and analysis of perceptions and experience of dog bites and bite prevention. The model posits that health outcomes (such as being bitten) depend on interactions between an individual's constitutional factors (such as age or sex), lifestyle factors, social and community networks, living and working conditions, and general socioeconomic, cultural and environmental conditions (Dahlgren and Whitehead, 1991). The latter factors include, for example, how money and resources are distributed both globally

and nationally, economic and social policies (including dog bite prevention policies), social norms and political systems (WHO, 2017). This approach has important implications for bite prevention, because while the constitutional factors (such as individual's age) cannot be altered through public health interventions, and lifestyle factors are generally difficult to address (and impact on individuals lives), the socioeconomic, cultural and environmental conditions have far broader impact on the health of a population (Frieden, 2010).

Figure 1.3. *The model of health determinants (In: Dahlgren and Whitehead, 1991).*

1.5 Research objectives

Within this context, this study aimed to examine the experiences and perceptions of dog bites and practices related to managing risk and negotiating safety around dogs, among people with different experiences of dogs and dog bites. The central argument presented here is that perception and prevention of bites depends on how risk of bites is constructed and perceived.

The aim of this study is:

To explore how people perceive risk and safety around dogs and how they develop any related practices around dogs.

The objectives of this study were therefore as follows:

1. To explore how bite victims and owners experience dog bites in different contexts (e.g. within work context and by own dogs);
2. To explore how the relationship and interactions with a dog influence bites, and vice versa;

3. To understand how the consequences of dog bites shape the perception of risk and safety around dogs and dog-related practices;
4. To explore how social determinants of health may shape practices around dogs, perceptions of bites and bite prevention;
5. To provide recommendations on best practice in bite prevention.

1.6 Thesis structure

This thesis consists of 9 chapters:

In Chapter 2 I discuss and critique relevant literature on perceptions of risk and injury prevention.

In Chapter 3, I examine the reasons for taking a symbolical interactionism approach and exploring dog bites through multi-sited ethnography. Methods of data collection are also explained alongside a description of the study sites and participant recruitment. The thematic analysis approach taken here is outlined.

Chapters 4-9 summarise the research findings and in turn, show how the perception and prevention of bites depends on how risk of bites is constructed and perceived.

Chapter 4 summarises an exploration of different perceptions of dog bites using comments posted in response to videos of dog bites and highlights the importance of perception of breed in assessing risk. It also shows how attributing responsibility for the bite is linked with blaming, thus mapping onto objective 3 by helping to explore how perceptions of risk are formed.

Chapter 5 offers a quantitative overview of bites within occupational contexts and a summary of bite prevention methods listed by the employers in formal reports. Chapter 6 explores the same approach from a bottom up perspective, by scrutinising how employees of organisations as well as dog owners rely on procedures to negotiate safety around dogs. The same Chapter discusses how procedures are enacted in practice and why they fail. Therefore, Chapters 5 and 6 map onto objectives 1 (by showing how safety practices around dogs are developed), 5 (by showing how fear of being blamed for a bite alters perception of risk and dog related practices at work and how social relations are needed to keep people safe), and

6 (by showing how the work environment contributes to practices around dogs, perceptions of bites and bite prevention strategies).

In Chapter 7 and 8, alternatives to reliance on procedures for bite prevention are discussed. In Chapter 7, I discuss the role of trust as a proxy for assessing risk posed by dogs. As trust is a profoundly social process, preventing dog bites also relies on social interactions and working together. This Chapter addresses objectives 1 and 2 by highlighting how a relationship with dogs shapes bite prevention. Chapter 8 shows how people interacting with dogs manage risk by relying on emotions and intuition to control their behaviour. This Chapter taps into objectives 1 and 2 as it further highlights the link between relationship with dogs and bite prevention and by outlining how risk in dogs is perceived and how it shapes practices around dogs.

Chapter 9 returns to the consequences of bites and shows the impact of bites on bite victims. Coping mechanisms are discussed and in the recommendations, suggestions how injury prevention could be more holistically tackled by also reducing the impact of bites after they occurred, is scrutinised. This Chapter addresses the objectives 2 and 3 by highlighting the experiences of bites and how consequences of bites shape future practices. Chapters 3-8 include recommendations for bite prevention, thus addressing the objective 5.

Chapter 10 presents an over-arching discussion of the findings from previous Chapters. Implications of this research are outlined, and further recommendations offered. I argue that while risk of bites is usually seen as linked with qualities of an individual and as an individual responsibility, in practice, it requires management of a whole network of actors (dog owners, members of the public, dogs, colleagues, but also equipment used for safety and space) to achieve safety. I suggest it is necessary to expand bite prevention to address perceptions and social norms which promote unsafe behaviours as well as through environmental modifications.

2 Literature Review

2.1 Scope and structure of the review

Rather than providing a systematic overview of factors linked with dog bites (for which please consult: Newman et al., 2017a), the purpose of this review is to:

1. Highlight different conceptualisations of risk and what they elucidate regarding perceptions of dogs, dog bites and bite prevention;

2. Illustrate the way in which dog bites may be similar to other involuntary injuries and discuss barriers to injury prevention;

3. Discus the existing approaches to preventing other types of injury and situate dog bite prevention within this context.

In the first part of this Chapter, I present an overview of different theoretical frameworks for understanding risk, as further Chapters draw on this literature. Realist approaches to risk are discussed first and epidemiological research into dog bites is used as an example. Subsequently, psychological perspectives on risk are presented and perceptions of dogs and dog bites are reviewed. Later, three leading socio-cultural theories of risk are outlined: symbolic-cultural theory (Douglas, 1992); risk society theory (Beck et al., 1993, Giddens, 1990) and governmentality theory (Lupton, 1999a, Foucault, 1991). In the second part, I review the literature on non-intentional injuries to adults and children, compare it to literature on dog bites and discuss barriers to injury prevention. In the final part, I show existing approaches to injury prevention to highlight the gap and opportunities for future bite prevention.

2.2 Realist approaches to risk: epidemiology of dog bites

2.2.1 Overview of the realist approach

In 'realist theories' (Lupton, 1999a, p.21), such as epidemiology, risk is seen as an empirical, quantifiable, and objective phenomena. Within this framework risk is typically defined as: probability of the event (like a dog bite) x severity of the event (i.e. outcome and impact on health, damage to physical structures or cost) (Royal Society, 1992). Risk therefore reflects

hazards in the environment i.e. things that can cause damage or injury (Royal Society, 1992). Research into dog bites and bite prevention policies typically build on this understanding of risk. Epidemiological studies often aim to quantify risk by identifying risk factors (i.e. things that increase or decrease the chances of an event, like a dog bite (Newman et al., 2017a)). These studies point towards genetics as the most consistent predictor of dog aggression (Newman et al., 2017). However, despite extensive research in this area, a systematic review did not identify a single study which could be classified as offering high quality evidence of risk factors for human-directed dog aggression (Newman et al., 2017). Small sample sizes, differences in defining bites, and study design compromised the quality of evidence (Newman et al., 2017a). Nonetheless, the identified factors are commonly discussed and may shape perceptions and interactions with dogs and influence formal approaches to dog bite prevention. For this reason, risk factors and commonly observed patterns related to the victims, dogs and the environment within which the interactions take place are summarised in Table 1.1.

Table 1.1. *Commonly observed patterns of and risk factors for dog bites relating to the victim, the dog, the environment and context of interactions.*

Victim-related patterns		
Risk factors/ pattern	**Detail**	**Reference**
Age	Children and in particular children <5 years of age are more commonly seen in hospital as a result of being bitten and are at a higher risk of bites. Higher risk for children age 10-12	Fein et al. (2019), Holzer et al. (2019), Touré et al. (2015), Súilleabháin (2015), Winter (2015), Rosado et al. (2007), Klaassen et al. (1996), Mannion et al. (2015), Reisner et al. (2011), Rezac et al. (2015). Fein et al. (2019), Caffrey et al. (2019)

Victim's sex	Male victims found to be at a higher risk	Cornelissen and Hopster (2010), (Garvey et al., 2015, Klaassen et al., 1996, Loder, 2019, Messam et al., 2018, Rosado et al., 2007, Súilleabháin, 2015, Westgarth et al., 2018)
	Female victims found to be at a higher risk	Fein et al. (2019)
Socio-economic deprivation	Socio-economic status is negatively correlated with the number of dog bites	Loder (2019), Winter (2015), Vertalka et al. (2018), Reese et al. (2019)
Being able-bodied and victim's ability to interact with a dog	Absence of an abled-bodied person to intervene and compromised victim's ability to interact with a dog (e.g.: due to being intoxicated, young or disabled) was reported as common factor in lethal dog attacks	Patronek et al. (2013)
Victim's occupation	Postal workers and veterinary workers are at a higher risk of dog bites	Oliveira et al. (2013), Lockwood and Beck (1975), Chen et al. (2000), Fritschi et al. (2006), Lucas et al. (2009), Landercasper et al. (1988)
Dog-related patterns		
Dog's sex	Male dogs reported to bite more often than female dog	Reisner et al. (2007), Reisner et al. (2005), Wake et al. (2009), Lord et al. (2017), Oxley et al. (2018)

	Neutered females reported as a risk factor for dog aggression	(O'farrell and Peachey, 1990)
Neutering status	Most fatal dog attacks reported to include an unneutered male dog. Unneutered male dogs are also reported to be more likely to bite strangers. No relationship between risk of bites and dogs neutering status	Gershman et al. (1994), Patronek et al. (2013) Shuler et al. (2008) Casey et al., (2014); Reisner et al., (2005)
Age of a dog	No relationship between age of a dog and risk	Gershman et al. (1994); Guy *et al*., (2001); Reisner, *et al*., (2005)
Prior history of aggression or fear	Dogs that have bitten in the past or were fearful around strangers are more likely to bite	Guy *et al*., (2001); Reisner *et al.,* (2005); Reisner et al., (2007); Flint et al. (2017)
Parental behaviour	Aggressive behaviour of parents is linked with a higher risk of aggressive behaviour in pups	Saetre et al. (2006); Strandberg et al. (2005); Foyer et al. (2016), (Våge et al., 2010)
Training method	Use of aversive training technique was linked with higher chances of human-directed aggression No clear relationship between training methods and aggression	Ziv (2017), Fernandes et al. (2017). Casey *et al.* (2014); Guy, *et al*., (2001); Reisner, *et al*., (2005)

Attendance of puppy classes	Attending puppy classes for longer is linked with an increased risk of human-directed aggression Attending puppy classes is linked with lower chances of owner-directed aggression	Lord et al. (2017) González-Martínez et al. (2019)
History of painful medical conditions	Presence of painful conditions is a risk factor for owner-directed aggression	Guy *et al*., (2001); Reisner *et al., (*2007)
Context-related patterns		
Time of the year	Summer December	Oxley et al. (2018), Rosado et al. (2007), Shuler et al. (2008) Winter (2015), Garvey et al. (2015)
Thunderstorms and above-average mean temperatures	Presence of thunderstorms and high temperatures is associated with an increase in a number of bites	Ramgopal et al. (2019)
Day of the week	More bites are observed on weekend and fewer on Thursdays	Loder (2019)
Environment	More bites reported in urban areas (UK) Higher risk of bites in rural areas (New Zealand & Spain-general population; Taiwan-postal workers)	Winter (2015) Rosado et al. (2007), Wake et al. (2009), Chen et al. (2000)

Familiarity with a dog/ being the owner of the dog	Majority of bite victims are familiar with the dog who bit them Majority of bite victims are unfamiliar with the dog who bit them	Oxley et al. (2018), Klaassen et al. (1996), De Keuster et al. (2006), Reisner et al. (2011), Rezac et al. (2015), Garvey et al. (2015) Westgarth et al. (2018), Patronek et al., (2013) for fatal dog attacks
Location of interactions	Majority of bites occur in private premises	Fein et al. (2019), Loder (2019), Wake et al. (2009), Cornelissen and Hopster (2010).

2.2.2 Limitations of epidemiological approaches

Epidemiological studies often rely on victims' accounts, which may be inaccurate due to reliability of recall. For example, as described in the Chapter 1, accuracy of breed identification is poor. Table 1.1 highlights a further problem: the observed patterns and risks regarding dog bites are often inconclusive or contradictory, potentially because research is specific to a given population and not generalizable. Epidemiological models are not designed to illuminate how context-specific socio-cultural processes shape risk. For instance, complex characteristics and experiences such as "socio-economic deprivation" need to be translated into a calculable and observable measures. Socio-economic deprivation is a composite score measured by combining rates of employment, income, health and disability measures, education levels, barriers to housing and services, crime rate and living environment measure (e.g. access to green spaces (Deas et al., 2003)). People with the same combined score may have different life experiences and different experience with dog bites. For instance, environmental factors, such as empty, derelict buildings higher crime rates and lower education attainment, typically included within an index of multiple deprivation, predicted hospital admissions due to bites in Detroit well (Vertalka et al., 2018). In the same study

income and income inequality – also typically linked with index of multiple deprivation – did not predict bites (Vertalka et al., 2018). Composite scores that aim to quantify complex life experiences may therefore obfuscate individual differences.

The realist analysis of risk also does not provide an explanation of the observed processes. For example, in the UK, the victim's location is correlated with higher risk of bites (e.g. the bite risk in Merseyside is 23.6/100,000 population vs. 5.3/100,000 in Kent and Medway; (Winter, 2014). These figures do not account for the number of dogs in a given area, making this result hard to explain. The areas differ with respect to socio-economic deprivation, with Merseyside being significantly more socio-economically deprived than Kent and Medway (Winter, 2015). Within Liverpool, there are more dogs in more socio-economically deprived areas (Westgarth et al., 2013). It is therefore unclear whether it is the location, socio-economic deprivation and/or number of dogs (and/or other factors) that shape the observed pattern, or if there are other factors at play.

In summary, studies exploring the risk of dog bites in a tangible and measurable manner actually show that risk is primarily context and is interaction specific. This creates a paradox for understanding risk as objective. In addition, realist approaches to risk rely on creating constructs to help them identify and measure risk (such as socio-economic deprivation), which questions how observable risk really is.

2.3 Risk is shaped by perception: psychological views of risk

Psychological approaches can be broadly characterised as taking a critical realism position: hazards, such as dog bites, are seen as real but risk is seen as dependent on individual and hazard-characteristics (Lupton, 1999a). Risk is therefore often understood as a subjective experience, shaped by characteristics of risk and cognitive mechanisms which lead to mental shortcuts in risk evaluation and emotions that risk evokes (Tversky and Kahneman, 1973, Slovic, 2000, Renn, 1992, Loewenstein et al., 2001).

2.3.1 Psychometric model: Can familiarity and dread shape perception of risk in dogs?

The psychometric model of risk focuses on understanding how different facets of risk (such as dread, i.e. perception of risk being involuntary, global and catastrophic), familiarity, and number of people affected shape perception (Slovic, 2000).

Risks that evoke a strong feeling of dread or are perceived to affect a lot of people and are unfamiliar are consistently perceived as the most serious (Slovic, 2000). By contrast, even if the overall number of people affected is the same, risk that has an impact on considerable number people *over time* or is caused by common objects (e.g. cars vs. novel technology) rarely evokes strong feelings and is underestimated. As dogs are popular pets in Western societies (Murray et al., 2010), they are familiar and unlikely to induce dread, at least for most people. Therefore risk posed by dogs may be seen as smaller than risk posed by e.g. new viruses, regardless of the number of people actually affected. In addition, people may see risk in dogs they are personally familiar with as lesser to risk in dogs that they do not know. This risk perception bias may also help to understand support for breed-specific legislation in light of lack of evidence for their efficacy. It is plausible that listed breeds, such as Pit Bull terriers, as a result of frequent representation in the media as dangerous (Lodge and Hood, 2002, Delise, 2007, Kikuchi and Oxley, 2017, Harding, 2017, Clarke, 2017), evoke more dread than breeds that are commonly portrayed as family pets.

2.3.2 Biases in perception of risk

Assessments of risk in daily life are notoriously biased (Alhakami and Slovic, 1994, Zajonc, 1980). Patterns of these biases of judgment are known as heuristics biases (Tversky and Kahneman, 1973). Several biases are likely to shape understanding of risk in interactions with dogs. Tversky and Kahneman (1973) pointed towards the availability bias, which states that events that are more recent, frequent, vivid or easier to imagine have the greatest impact on perception of risk. For example, people who have recently been bitten may judge a consecutive bite as more likely and be more willing to change their practice to avert future bites. Being bitten by a particular type of dog or the prominence of images that portray a breed as aggressive, may also influence the perception of risk around a particular breed or type. For example one study reported how a story and photographs of dogs shown to participants before the risk assessment task biased the assessment of the dogs (Wells et al.,

2012). In other studies, representation of a dog with different handlers (e.g. a child, elderly woman and a young tattooed man) altered perceptions of the dog's temperament (Gunter et al., 2016, Walsh et al., 2007).

The overconfidence bias (Tversky and Kahneman, 1973) refers to placing excessive confidence in ones' own knowledge and estimation of risk, despite new information being given or having insufficient information to make a judgment. Indeed, prior experience with dogs improves confidence but not necessarily understanding of dog behaviour (Tami and Gallagher, 2009), which could reflect the overconfidence bias. As a result of overconfidence bias, dog owners may over-estimate their knowledge of dog behaviour. The implication of this bias is that individuals at risk of bites may not recognise themselves as at risk and thus see prevention advice as irrelevant to them.

Hindsight bias (Slovic, 2000), states that in retrospect, people see the events as easily predictable and are confident about the possibility of recognising factors that led to the event. This bias applies to bite prevention as a bite recipient may be able to identify a number of behaviours that have led to being bitten *after* the event. This does not mean that they were able to identify the same clues in real time. The hindsight bias could explain why bite victims often blame themselves for bites and think of bites as preventable (Westgarth and Watkins, 2015).

2.3.3 Drawing on emotions to assess the risk

Psychological studies show the importance of emotions, such as fear, in assessing risk and shaping risk perception (Slovic and Peters, 2006). Risk perception in real life is not rational or proportional to the risk itself. A feeling (i.e. an experienced emotion) such as anxiety, may affect risk assessment and increase person's risk aversion; risk that evokes negative feelings may also be assessed as more serious (Loewenstein et al., 2001). Using emotions to asses risk is referred to as affect heuristic (Loewenstein et al., 2001). In response to affect heuristic people who enjoy interactions with a dog may underestimate the risk of a bite and develop different practices for risk management than people who are scared of dogs. More broadly, emotions play a part in understanding risk and shape practices around dogs, but it is unclear how.

2.3.4 Individual characteristics shaping risk perception

Perceptions of risk can also be influenced by individual characteristics, although some suggest that these have relatively small impacts (Sjöberg, 1996). In Western societies, older people, women and ethnic minorities are generally more risk-averse than younger people, men or white ethnicity (Finucane et al., 2000b, Byrnes et al., 1999, Flynn et al., 1994, Rhodes and Pivik, 2011, Kim-Spoon et al., 2015). However, these differences in risk perceptions are likely to reflect different social positions linked with these characteristics rather than gender or ethnicity *per se* (Finucane et al., 2000b), again highlighting how simplifying complex interactions to measurable factors may obfuscate complex structures that underpin the behaviour. Personality traits also shape individual risk perceptions. For example, higher scores on neuroticism (i.e. low emotional stability), but not extraversion, correlated with higher risk of dog bites (Westgarth et al., 2018). It is plausible that this personality trait shaped risk perception and interactions with dogs or because low emotional stability had a direct influence on interactions with dogs.

2.3.5 Risk as an effect of communication

Communication of risk can influence risk perception, e.g. how risk is described can alter the judgement of risk. For example, cumulative probability (i.e. a probability that an event will occur during a lifetime) has been shown to increase risk perception compared with probability expressed per event (e.g. a probability that an event occurs on a given day; Slovic, 2000). The format that information about dog bites takes may impact on bite perception and prevention. For instance, communicating the probability that a postal worker is bitten during their lifetime versus the probability that a given postal worker is bitten on a given day could influence attitudes towards dog bite prevention. Secondly, the 'social amplification of risk framework' (SARF) suggests that the perception of risk can be amplified or attenuated depending on how the story of risk is circulated in the media (Kasperson et al., 1988, Kasperson et al.,2003). The SARF model postulates that the characteristics of risk are not as important in affecting risk perception as the way it is communicated (Kasperson *et al.* 1988). For instance, within Western media and popular culture, pit bull terriers and bull breeds are typically represented as dangerous, aggressive and indicative of criminal activity (McCarthy, 2016, Cohen and

Richardson, 2002, Patronek et al., 2000, Clarke, 2017). This portrayal is likely to contribute to perception of these breeds being linked with greater risk (Molloy, 2011).

2.3.6 Critique of psychological studies of risk

The psychological approaches to risk help to explain how the characteristics of the assessor and risk itself shape perceptions and practices of risk management. These approaches have been criticised for being largely apolitical: they do not account for how cultural contexts and socio-economic circumstances affect perception of risk (Douglas and Wildavsky, 1983). Impact of individual prior experience, physical and social environment on perception is also often overlooked. Moreover, psychological bias studies typically explore a response to a specific risk in an experimental setting, which limits their generalisability. As human-dog interactions take place in naturalistic settings, psychological models alone cannot explain perceptions of dog bites and practices involved in management of risk. Just like realist approaches to risk, the psychological framework also often requires reducing composite concepts, such as 'context', 'culture', or 'experience' to a single variable, oversimplifying the way they shape individual perceptions and interactions with dogs (Lupton, 1999a).

A limitation of the SARF model is that it does not offer any ways of assessing how communication is shaped (Duckett and Busby, 2013). In addition, media representation is rarely unidirectional (Duckett and Busby, 2013). For example, popular press articles which emphasize the role of breed in dog attacks are often published alongside individual accounts that negate this idea. The final decision as to whether risk representation is attenuated or amplified is individual, and the model does not account for how intersubjective characteristics may shape perceptions (Duckett and Busby, 2013).

2.4 Risk is constructed: sociological approaches to risk

Social theories of risk are based on several shared observations and a broad critique of realist approaches. Firstly, risk seems to be more prominent in contemporary society as a framework through which bad fortune is explained than it has been in the past (where the explanatory framework may have been based on fate, religion, spirituality or bad luck) (Ewald, 1993). In this sense risk is a relatively new construct. Explaining misfortunes as due to the 'devil's work'

led to a development of relevant practices and customs that helped to avert it (such as drowning kittens born in May in medieval France; Ewald, 1993). In a similar way, conceptualising misfortune in terms of risk, leads to practices and customs aimed to reduce the odds, manage or eradicate it and an industry dedicated to managing risk and promoting safety, e.g. through the development of procedures (Power, 2004). Additionally, risk is also seen as specific to a given context, rather than universal; culture, individual life experiences, social structures, discourse, and physical environment all shape what is being identified as risk and how people relate to it (Zinn and Taylor-Gooby, 2006, Lupton, 1999a).

Furthermore, the meaning of risk has changed: in the past risk did not imply that someone was responsible for the event or that the event was indeed preventable (Ewald, 1993). The link between preventability, responsibility and risk only emerged in the 19th century, when risk became associated with "rational thinking, bureaucratic system of prevention, ways of identifying threats before they take effect" (Lupton, 1999a p. 4). In a sense, in all modes of analysis risk is a construct as it helps to frame probability and severity of events that *have not yet happened* (Rigakos and Law, 2009). This means that when events are framed in terms of risk, prevention is possible, and where prevention is possible, inaction or wrongful action is seen in moral terms. Therefore, risk is also always an expression of morality as it includes a suggestion that someone or something will be harmed, threatened or worse off (Rigakos and Law, 2009).

Anthropological and sociological theories typically see risk as socially constructed rather than objective (Fox, 1999). The theories differ however in the degree to which they believe risk and hazards are constructed through social processes. I follow Lupton's classification (1999) and discuss three broad approaches to risk within sociology and anthropology: the cultural/ symbolic approaches, the risk society theory and the governmentality perspective. I will show how they differ, offer a brief critique, and highlight how they could be helpful in understanding dog bites.

2.4.1 Symbolic/cultural approach to risk

The cultural/symbolic theory argues that both hazards and dangers are real, but what is recognised as risk reflects a political choice of what society considers as important,

newsworthy and challenging its values (Douglas, 1992). Therefore, risk identification reflects and maintains social norms and contributes to shaping individual and group identities as it symbolises the values that "we" or "I" stand for and things that "we" or "I" cast aside. In Douglas' writing, culture helps individuals assess risk; the heuristic biases are seen as defined and limited by a shared culture rather than universal psychological phenomena (Lupton, 1999a).

A second tenant of the cultural/symbolic approach is that risk is only possible when an individual, institution or another culture can be assigned blame for it (Douglas, 2013); risk and blame are inherently intertwined. As risk identification has a symbolic function in defining identity, blame reinforces moral norms by highlighting threats to the group or self. Blame emerged as an important theme in an early qualitative study of dog bite perception (Westgarth & Watkins, 2015) as well. Bite recipients blamed themselves when bitten by a familiar dog and the dog owner when the victim had no relationship with a dog. Dogs themselves were rarely blamed (Oxley et al., 2018; Westgarth & Watkins, 2015). This show that bite victims expected themselves or dog owners to prevent future bites

A further contribution of the cultural/symbolic approach includes explaining why some dangers are seen as a risk at a given time and place, while others are not. Within this approach, given that dog bites have always been a part of dog ownership, what is identified as a risk in human-dog relationships and how in the contemporary discussion, is particularly interesting. For instance, in Victorian Britain, risk was associated with dogs kept by the working class and it was constructed by linking these dogs with rabies (McCarthy, 2016). It has been suggested that pit bulls, but not German Shepherds or Rottweilers, were selected as a dangerous breed in the 1991 legislation because they remain associated with the working class (McCarthy, 2016). Risk of bites has therefore shifted from concerns over rabies to concerns over the responsibility of the dog's owners. Moreover, not all bites are equally problematic. Perceptions of bites being 'just one of those things', i.e. bites being normal, at least in some contexts, has also been identified (Westgarth & Watkins, 2015). Sanders (1990) discussed a range of "excusing tactics" that owners use to justify behaviours of dogs that break social conventions, for instance rephrasing the potentially dangerous behaviour as funny. Fox (2006) showed how owners reframe unwanted behaviours of pets as biological

and natural, to reframe dangerous behaviours as acceptable. Orritt, Gross, and Hogue (2015) demonstrated that owners and dog professionals alike rationalise aggressive behaviours and, depending on the context and an owner's relations with a dog, see it as justified. Together, these studies show that dangerous behaviours of dogs, including dog bites, is not always identified as risky and may be seen as normal in some circumstances. Following this theory, managing or reducing risk has to start with changing cultural values, norms and identities.

A symbolic-cultural approach is helpful in highlighting how risk and blame are constructed. It also characterises blame as not obviously linked with the identified risk and in this way helps to elucidate how blame and responsibility for safety around dogs are constructed rather than given.

2.4.2 Risk society theory

The risk society theory is a macro-level framework which argues that risk is a defining feature of late modernity and shapes self-understanding and relations with others and social institutions (Giddens, 1991, Beck et al., 1992). Beck's work rarely looks at risk in ordinary everyday routines, (like interactions with dogs), as he builds his theory around novel, technology-driven risk which has a global and potentially catastrophic impact (Beck's et al.1992). Beck's work has been critiqued for over-emphasising the new risks, and characterising the distinction between hazards linked with human activity and natural hazards as stark, while the two are often interrelated (Mythen, 2007). Discussing the risk that dogs pose in terms of over-breeding and genetics could be interpreted as a man-made risk. However, this view of bite risk is only one element of understanding human-dog interactions, and the theoretical focus on technology, science and global impact limits how useful this approach is in understanding dog bites.

Within the context of this thesis, a more productive facet of the risk society theory is the concept of reflexivity, defined as the "response to conditions that arouse fear or anxiety that is active rather than passive" (Lupton, 1999a p. 23). Reflexivity describes risk assessment as ongoing, all-encompassing process that orients individuals to the future as they are always evaluating various contingencies based on different outcomes to optimise their wellbeing or minimise the future damage (Lupton, 1999). As a result of reflexivity, risk management is seen

as individuals' moral duty and no aspects of human practice are seen as appropriate to be left to chance (Lupton, 1999a). Practices described under the banner of reflexivity help to tune in, notice, scrutinize and evaluate risk. The concept of reflexivity has been criticised for putting excessive emphasis on individuals developing skills around risk and questioning the role of experts (while assessing risk posed to themselves). It has been argued that scepticism around expert judgment has always been a part of the process of knowledge production (Lupton, 1999a).

In different ways, both Giddens and Beck view reflexive practices as coping mechanisms for living with uncertainty and risk as well as processes through which risk is identified. In Giddens' writing, trust is the backbone of reflexivity, as reflexivity necessitates further reliance and trust in expert knowledge (Giddens, 1990). Giddens (1990) sees trust as a mechanism which helps people to cope with risk and relieve anxiety linked with uncertainty. He argues that trusting (e.g. an expert, a company or a friend) helps to justify and motivate action when a person does not have sufficient knowledge to evaluate risk. Trust is therefore necessary to act, and action helps individuals to develop a sense of security (Giddens, 1990). In addition, in Giddens's work, daily routines are also "important in the establishment and maintenance of ontological security, allowing people to habitually deal with dangers and associated fears" (Lupton, 1999: 106).

By comparison, Beck argues that the selection of specific risks to take notice offers a self-protection mechanism, as it provides a semblance of control and normality by helping to ignore other (unselected) risks (Beck, 1995). For Beck, some risks are the focus of attention because they can be controlled, not necessarily because they are important (Beck, 1995). Following the risk society theory, it could also be reasoned that the effectiveness of policies for bite prevention (or other risk control measures) matters less than the psychological relief they offer by being created. For example, it could be argued that public health campaigns and the public are focused on dog bite risk because it is perceived as more manageable than other, possibly more important factors influencing individual health, such as structural inequalities (Crowley and Hodson, 2014).

Crucial for the risk society theory, is the process of individualisation. Individualisation is linked with erosion of previously stable social structures such as family or gender norms and lack of unanimous authorities of expert advice (Dean, 1997). As individuals cannot define themselves in relation to these meta-structures, they have to define their identities independently (Lupton, 1990). As a consequence of individualisation, inequalities are seen as "psychological dispositions: as personal inadequacies, guilt feelings, anxieties, conflicts and neuroses" (Beck et al., 1992 p. 100) rather than an outcome of a social system, which may promote inequity. For instance, bite victims often blamed themselves for the bite and therefore as responsible for avoiding it (Westgarth & Watkins, 2015). The concept of individualisation could help to explain responsibilisation, i.e. how people are seen as responsible for their own risk.

2.4.3 Governmentality theory

The third socio-cultural approach to risk perception follows largely from writings of Michael Foucault on governmentality and power (Foucault, 1991). The crux of this theory is the idea that risk is not discovered or reflective of hazards but that both are constructed through discourse, practices, strategies and institutions surrounding them (Lupton, 1999a, Fox, 1999). Within this approach, a dog is not dangerous in its own right, it becomes a hazard when in a particular context or when it is assessed as being of a dangerous breed, due to discourse around that breed. The development of the Pit Bull Terrier identification toolkit, which includes measurements of dogs' proportions (*Dangerous Dogs Act 1991*, 1991) could be viewed as a construction of a hazard. By using the measurements, the individual dogs are constructed as pit bulls. When they are officially "typed" and sectioned, this requires owners to then go through a legal procedure to have them exempted from being destroyed, under a condition of specific management of the dog in the future. It is therefore through processes of risk management that constructed risk is mapped onto hazards.

Foucault (1991) described the collective of tools through which hazards and risks are created as disciplinary power i.e. power to regulate the behaviour of individuals. The key mechanisms for regulation involve surveillance, observations and measurements (e.g. medical screenings or keeping records of weight measurements of children in schools). These aid definitions of what is normal and by having the norm, shape populations as individuals regulate themselves to fit with the norm. Normalisation, i.e. "the method by which norms of behaviour or health

status are identified in populations and by which individuals are then compared to determine how best they fit the norm", is one of the ways through which risk is managed (Lupton, 1999:4). Societal order is maintained through internalised and voluntary self-discipline, which is reinforced through social structures and institutions (e.g. being asked about smoking or weight during a routine visit to a general practitioner (Foucault, 1991)).

This approach has been productive in studies of health as the theory demonstrates how defining a group as 'at risk' leads to blaming the group for their problems and self-policing (Zinn, 2004). In tandem with normalisation, Foucauldian scholars in particular emphasised individualisation of risk and individual moral responsibility for risk management (Zinn and Taylor-Gooby, 2006). Within this approach, inability to avoid risk behaviour is tantamount to "a form of irrationality, or simply a lack of skilfulness" (Greco, 1993 p. 361), which reinforces seeing risk as a moral judgement. Avoiding risk is further framed as individual responsibility by arguing that risk is linked with "lifestyle choices" (Lupton, 1995), which downplays the responsibility of government in developing environments and policies that promote good health (Dean, 1997). Governmentality scholars also show how making individuals responsible for their own health leads to overemphasising the ability of individuals to change their behaviour and control risk, which is notoriously difficult (Clarke et al., 2010). For example, the ways in which individualisation, normalisation and responsibilisation manifest themselves is seen in portrayals of pregnant women as at risk of miscarriage but also a source of risk to their unborn children (Lupton, 1999b). Normalisation dictates the behaviours (such as not eating unpasteurised milk or raw fish), and practices (e.g. attending pre-natal classes, being interested in health of the baby etc.) through which women police their own bodies and bodies of other women, as these practices become the norm (Lupton, 1999b). Pregnancy is experienced through a prism of risk that needs to be managed and an expectation that woman are able to and should manage this risk (Lupton, 1999b). Aspects of pregnancy that cannot be controlled are rarely recognised and difficulties in pregnancy are typically attributed to women's behaviour (Lupton, 1999b). Similarly, dog bites are frequently attributed to irresponsible dog ownership and rarely discussed as an unpreventable chance event. Applied to dog bites, the governmentality perspective could further help to understand how hazards and risk around dog bites are constructed and what impact, other than preventing bites, they may have.

As the governmentality approach takes a highly constructionist view on risk, it is often criticised for not accounting for the existence of real, harmful things, which have tangible consequences (Lupton, 1999a). The approach is also often not focused on risk, but rather on technologies that perpetuated current understanding, such as dominant discourses, forms of knowledge, social institutions (Lupton, 1999a). Governmentality, and in particular the writing of Foucault, has also been critiqued for providing a meta-theory of risk, which is not focused on daily practices through which risk is managed. In these encounters, individual embodied characteristics, such as gender, age and ability are crucial, but this approach often fails to engage with them (Lupton, 1999a).

2.5 Understanding behaviours around dogs and changing them

There are several parallels between patterns of unintentional injuries to adults and children and the contexts and circumstances in which bites occur. These include victim demographic, importance of social norms in shaping behaviour and designing prevention strategies and the way the physical environment contributes to a greater risk of injury. By exploring these similarities, I hope to map out the established methods of injury prevention which could be applied to dog bites.

2.5.1 Demographic characteristics of people at risk of unintentional injuries

In the UK, most injuries occur at home, and so do most dog bites (Kerr, 2007). Children and older adults are the most often seriously injured demographic, as are individuals with disabilities (Mack and DeSafey Liller, 2010). The same demographic is seen in dog bite cases (Table 1.1).

A review of all injury patterns in the UK and Europe shows that men are more likely to be injured than women, within occupational and other contexts (Alexandrescu et al., 2009, Smith et al., 2005). Chances of being injured at work versus at home increase with age and among the 55-65 age group nearly half (49%) of all injuries recorded in the USA occur at work (Smith et al., 2005). Most, but not all non-fatal injuries are correlated with socio-economic inequalities, with lower socio-economic status being associated with greater prevalence of injury (Alexandrescu et al., 2009). Again, similar patterns were observed for dog bites (Table

1.1), which suggests shared underlying reasons for injuries in different contexts (Salminen, 2005).

Children that have poor impulse control and want to seek sensations are more prone to injuries than children with better impulse control and who are less sensation-seeking (Morrongiello and Schwebel, 2017). Children with externalising behaviour disorders also had a higher risk of a dog bite (Holzer et al., 2019). Similar to the pattern described for adults, socio-economic deprivation is correlated with more hazards within children's environments and more injuries (Morrongiello and Schwebel, 2017). Compared to young children, youth (defined as children above they age of 7) are more often injured outside of home (Morrongiello and Schwebel, 2017). Differences in contexts in which injuries occur suggests that preventive approaches should be tailored to the particular demographic.

2.5.2 Contexts in which bites occur

Environmental factors related to the dog and the person play a part in dog bites. Common circumstances in which adults are bitten include manipulating a dog in an aversive/painful way (e.g. grabbing, restraining, vaccinating, trying to help an injured dog, intervening in a dog fight); playing with or near a dog; trying to handle a dog (e.g. stroking or petting); and passing by a dog (Rosado et al., 2007, Oxley et al., 2018). Proximity to the dog – e.g. bending over a dog – was highlighted as a human behaviour preceding bites to the face (Rezac *et al*. 2015) and in other contexts (Owczarczak-Garstecka et al., 2018). Compared to adults, older children are more often bitten in the context of play with or around a dog (Owczarczak-Garstecka et al., 2018, Náhlík et al., 2011, Touré et al., 2015, Arhant et al., 2017) and young children (under the age of 4) in the context of (intentionally) benign interactions, such as hugging or kissing (Reisner et al., 2011).

Differences in the contexts of bites have been observed between dog owners and non-owners: 90% of owners bitten by their own dog interacted with a dog before the bite (opposed to 48% of bites to non-dog owners (Cornelissen and Hopster, 2010)). Proportion of bites that occur in public places is higher in adults and older children (10-12 year old) than in younger children (usually defined as <5 year old), who are proportionally more often bitten within a home environment (Caffrey et al., 2019; Cornelissen & Hopster, 2010; Fein et al.,

2019; Cornelissen & Hopster, 2010; De Keuster et al., 2006; Rezac et al., 2015). A third of bites that occur to children in public places have been attributed to the child's interaction with the dog (as reported by parents or a child) (De Keuster et al., 2006). Moreover, children unfamiliar with a dog were usually bitten in a specific context when entering or being present in a dog's perceived territory, regardless of whether they did or did not interact with the dog (Reisner et al., 2011). The context of interactions preceding bites is therefore slightly different for children and adults, with children being more often bitten while playing and adults when handling a dog, or causing them pain or possibly while entering their territory. In addition, familiarity with a dog seems to influence the circumstances in which bites occur.

2.5.3 Barriers to injury prevention: problematic perceptions

Perception of risk, such as seeing oneself as not able to control risk, can hinder injury prevention. Fatalistic views, i.e. beliefs regarding lack of control over risk, can take a form of a belief that: 1) there are no effective ways of preventing the incident (response efficacy); 2) that an individual has no control over the incident (self-efficacy); and 3) re-evaluating the threat as smaller than it is (Peters et al., 2013). Negative beliefs regarding response and self-efficacy limit motivation to learn and acting on that knowledge which could help to prevent injuries (Hemenway, 2013). Indeed referring to these injuries as accidents implies that not much can be done to avoid them and fuels low self-efficacy (Hemenway, 2013). For instance, where exposure to risk is high, and people believe that they have little control over processes, they tend to accept low-severity injuries as a "part of the job" (Breslin et al., 2007). Perception of injuries is also a barrier to preventing injuries to children. Mothers who believe that injuries are a part of growing up are reluctant to implement safety measures as they see injuries as not preventable (Ablewhite et al., 2015; Smithson et al., 2011; Azar, McGuier, Miller, Hernandez-Mekonnen, & Johnson, 2017). It is likely that similar barriers operate for dog bite prevention. Indeed, dog bite victims expressed often thought that bites are just one of those things that cannot be prevented (Westgarth and Watkins, 2015).

Another harmful perception is optimistic beliefs regarding risk which leads to thinking: "it will never happen to me" (Hemenway, 2013). This belief is maintained as a result of poor understanding of low probability events and perceived high costs of health-promoting behavior (Hemenway, 2013). Qualitative studies identified positive affirmation (e.g. desire to

ignore the risk and remain optimistic about the outcome despite the evidence or where there are no evidence) and wishful thinking (hoping the risk is low regardless of the information) as a psychological mechanism which helps to reduce the uncertainty around high risk events (Orom et al., 2015). It is therefore plausible that similar mechanisms are in place when discussing perceptions of risk in the context of human-dog interactions. Dog bite victims expressed this view: they thought that bites would not happen to them (Westgarth and Watkins, 2015).

The third unhelpful perception of bites is moralistic and can be seen in blaming the victim (Hemenway, 2013). This perception links with the individualisation of risk and seeing risk in moral terms described earlier. The view that an individual (or parent, caregiver) is responsible for injury prevention, hinders injury prevention as it detracts from understanding and motivating improvements on behalf of the industry or within a broader environment where interactions take place, which has been shown as more effective (Hemenway, 2013). Not assigning fault and avoiding penalizing for accidents also leads to safer systems as it facilitates learning from what went wrong and continuous improvements (Hemenway, 2009). Blaming oneself or the dog owner for the bite was a strong theme which emerged from studies of bite victims' experiences (Westgarth and Watkins, 2015), which shows that dog bites are seen through a moralistic lens. Perception of intention and blame for bites appears to be influenced by the relationship with a dog. In one study, most victims (67.5% of 424) felt that the dog intended to bite them, whereas 32.5% stated the bite was accidental (Oxley et al., 2018). Victims bitten by their own dog were more likely to state it was an accident than victims bitten by dogs owned by friends or family, or who did not know the dog (Oxley et al., 2018).

2.5.4 Barriers to injury prevention: social norms and socio-economic factors

Social norms can hinder engagement with injury prevention. Peer behaviour and encouragements to take risk (i.e. social norms) are the most important factor in predicting the likelihood of injury in children age 8-16 (Morrongiello & Schwebel, 2017). These norms are also amenable to change; when children encourage peers to be cautious, risk taking behaviours are reduced (Morrongiello & Schwebel, 2017). By contrast, the strongest predictor of injury to young children and toddlers are characteristics of parental supervision and

presence of hazards within the home environment (Morrongiello & Schwebel, 2017). Supervision (i.e. attention, proximity and continuity) predicts the frequency and severity of injury for young children: children sustain fewer injuries where caregivers are able to provide them better supervision (Morrongiello and Schwebel, 2017). Views of professionals advising on child safety (e.g. school nurses) expressed though formal education programmes had only a small effect on mother's practices and were more effective where the behaviour change required was simple (Sellström and Bremberg, 1996). Instead, subjective norms (e.g. views of family and friends) and social/contextual factors have far greater impact (Sellström & Bremberg, 1996). This illustrates the paramount importance that social relations may play in negotiating safety around dogs.

In addition, a systematic review and synthesis of qualitative studies into injury prevention to children shows a range of barriers to safety at a legislative, individual and environmental level (Smithson et al., 2011). Firstly, weak legislation or its poor implementation (e.g. regarding installing smoke detectors); lack of legislation (e.g. controlling production of children's toys) and misleading legislation (e.g. implying that "child-proof" containers are safe) were seen as a barrier to safety (Smithson et al., 2011). Parallel barriers could exist to bite prevention, if for instance, dog owners believe that some breeds or dogs are "child-proof". Poor communication and bad timing of communication regarding existing policies, resources or support were also a barrier. For instance, parents did not retain information given at the time of child's birth (Smithson et al., 2011, Ablewhite et al., 2015). Communication which did not take into account social norms relevant to the parent's community was also ineffective (Smithson et al., 2011). Current education material regarding dog bites may be limited as social norms regarding bite prevention have not been explored in depth.

A significant number of barriers were linked with low socioeconomic status: low family income, youth, immigration status, regular relocations, specifically hindered use of equipment helpful in childproofing because these parents lived in rented accommodation or with an extended family and did not have the resources to purchase and maintain the equipment (Smithson et al., 2011, Ablewhite et al., 2015, Gielen et al., 1995). Several individual level factors were a barriers to caregivers implementing safety measures: not anticipating how quickly children are able to climb, open containers and light fires (Smithson

et al., 2011, Ablewhite et al., 2015); overestimating children's ability to remember and follow instructions (Smithson et al., 2011); misjudging the outcomes of risk-taking activities; as well as failing to understand the likelihood or risk linked with an injury (Ablewhite et al., 2015). In addition, distractions, fatigue and presence of other children also disrupts maternal supervision (Ablewhite et al., 2015). A similar combination of socio-economic and demographic factors may contribute to dog bites experienced by children.

Within the context of bites to children, preliminary research suggests a difference in expert and lay knowledge (Arhant et al., 2016). For instance, parents intervene and supervise children around dogs less attentively than dog behaviour experts suggested in the same study (Arhant et al., 2016). Over 50% of surveyed parents regularly left an under 6 year old child with a dog (Arhant et al., 2016). A similar proportion allowed children to engage in behaviours associated with bites, such as hugging, or permitting a child to interact with a dog for as long as a child wants (Arhant et al., 2016). Parents used environmental controls, such as having a dog bed and feeding dogs away from children only occasionally, for example only 1/3 of participants used baby-gates (Arhant et al., 2016). Parents who presented as more aware of risk of bites (measured by asking parents to assess risk in contexts of child-dog interactions depicted on photos) were more cautious (Arhant et al., 2016). More broadly, caregivers' attention to supervision around dogs was on a par with general caution around children, i.e. caregivers who were generally more attentive and did not allow unsafe behaviours were also more attentive around children and dogs (Arhant et al., 2017). This shows how injury prevention around dogs is a subset of broader injury prevention beliefs.

A meta-analytic review of interventions which aimed to educate children on dog safety and prevent bite injuries concluded that recommendations regarding best approaches to education should be made with caution, as the quality of research evidence was overall poor (Shen et al., 2017). Nonetheless, the review suggested that cognitive/behavioural interventions (i.e. teaching children about dog behaviour in various contexts and showing how to interact with dogs) had a moderate effect in improving children's knowledge and a larger effect in improving children's behaviour with dogs than other types of interventions. However, none of the studies included in the review were able to test if the intervention actually resulted in a reduction in the number of bites (Shen et al., 2017). Moreover, studies

rarely consider other beliefs of children that could motivate their behaviour around dogs. For example, in one study children were able to correctly identify the behaviour of a dog as aggressive, but stated they would still interact with the dog (Jalongo, 2018). One child participant said that she knew when a dog was being aggressive but would still try to pet him "because I just love doggies so much" and other children said they would approach a dog to "try to cheer him up" or "make friends" (Jalongo, 2018, p. 283). Indeed, children under the age of 6 have difficulties recognising fear-related dog behaviour (Aldridge and Rose, 2019, Lakestani and Donaldson, 2015), and younger children frequently interpreted dog growling as smiling (Lakestani et al., 2014). In addition, while children as young as 3 years of age were able to improve their knowledge of dog behaviour (Lakestani et al., 2015), young children are less susceptible to educational interventions (Dixon et al., 2012), indicating a need for other approaches.

In summary, being able to learn about dog behaviour does not equate to being able to apply it in practice. This clearly illustrates that although education can help increase knowledge relevant to bite prevention in children, other factors that may shape safe interactions with dogs are largely unknown and other approaches to bite prevention are needed.

2.6 Models of accident prevention

To prevent dog bites (or other accidents) it is necessary to define what needs to be prevented. Within injury prevention literature, accidents are usually defined as "short, sudden, and unexpected events or occurrences that result in an unwanted and undesirable outcomes" (Hollnagel, 2016 , p.4). Incidents are seen as different to accidents in that their outcomes are less severe (Hollnagel, 2016, p.21). The difference between accidents and incidents is therefore qualitative rather than categorical (Hollnagel, 2016). Near misses are defined as "something that could have resulted in some kind of injury or property damage, but which did not" (Hollnagel, 2016 , p. 21). Near-misses are therefore similar to hazards.

There are a number of commonalities between dog bites and other unintentional injuries, yet the majority of approaches that successfully reduced the prevalence of injuries in other contexts have not been explored in the context of dog bites. At present, bite prevention is

focused on changing human behaviour (through education) and legislation which penalises owners whose dogs are dangerously out of control and restricts what breeds of dogs are legal.

2.6.1 Approaches to incident prevention

Models of accident prevention overlap to an extent with other approaches to understanding behaviour and developing behaviour change in that they emphasise the role of an individual and their environment in a lead up to an accident. Person-focused models are based on changing perceptions, knowledge and behaviours of individuals and see the individual behaviour as the main reason for incidents. On the other hand, system-focused models aim to change the system within which individual operate (Reason, 1990).

In person-focused models (typically taken in dog bite prevention), accidents are conceptualised as occurring because of an individual's action (or inaction), human error, or differences in human behaviour (Reason, 1990)). Consequently, prevention measures focus on reducing unwanted human behaviour (and between-individual differences in behaviour), largely through appealing to people's fear, threat of legal action, rules, restrictions, fines and blame etc. (Reason, 1990).

In the system-focused model, errors are seen as normal part of human behaviour and accidents are seen as consequences of poor system design. Within this model, accidents are prevented by designing multiple barriers and safeguards to prevent the consequences of a human or system error (Reason, 1990). In other words, in the system-focused approach, accident prevention focuses on the environment within which accidents take place. This model is, therefore, more akin to the ecological frameworks of behaviour change popularised within public health literature, i.e. frameworks that pay attention to individual, community, policy and physical environment factors (and interactions between them) in shaping behaviour (Davis et al., 2015).

2.6.2 Behaviour change frameworks

Behaviour change is a crucial outcome of incident prevention initiatives. There are a number of models of behaviour change. Here, I will briefly outline the most popular ones in order to

contextualise the Capabilities, Opportunities, Motivation, Behaviour (COM-B) model (Michie et al., 2008), which will be discussed in more details.

The transtheoretical model (TTM) of change focuses on how behaviour change evolves in time (Prochaska and DiClemente, 1983). The model highlights different stages of readiness to take action and suggests that time-specific approaches are needed depending on individual ability to adopt a new behaviour (Prochaska and DiClemente, 1983). Following from this model, multiple strategies for dog bite prevention could be suggested, depending on individual readiness to change their practice. By contrast, Diffusion of Innovation Theory (DIT) (Rogers, 1995) describes how new ideas and behaviours spread at a population level innovators, early adopters through to majority and finally laggards. In accordance to this theory, it is necessary to understand the characteristics of the population whose behaviour is being addressed, as different strategies work better for people early and later adopters. Early adopters do not need information on a *need* to change, just manuals on *how to* implement new behaviours while late adopters need incentives and information regarding why change is needed. Both TTM and DIT have been criticised for not accounting for individual demographic and social characteristics, as well as the broader social and environmental contexts within which a behaviour occurs.

Theory of Reasoned Action/Theory of Planned Behaviour (TPB), Health Belief Model (HBM), which adapts TPB for health-management contexts, and PRECEDE-PROCEEDE Model are commonly used in public health (Trifiletti et al., 2005). The TPB (Ajzen, 2011) and HBM propose that behaviour can be predicted from: the perception of illness (in this case dog bites) and the assessment of behaviours required to ameliorate the risk of illness (e.g. perception of what needs to happen to reduce the chances of being bitten or understandings of bite prevention strategies) (Conner & Norman, 2005). In HBM, the effect of perception of illness and evaluation of behaviour is filtered through demographic variables, social relations and other factors influencing the individual's perception. Both of these models are therefore largely focused on addressing individual perceptions and resultant behaviours, and less so the environment. What follows from these two models, is that engagement with bite prevention is expected to depend on perception of dogs, dog bites and individual capability to prevent them. As it has been previously suggested bite victims often think that bites are not avoidable

or believe that they would not be bitten (Westgarth & Watkins, 2015), thus prevention of bites may require addressing these beliefs.

Engagement and maintenance of health-related behaviour has been associated with factors other than perception such as individual socio-economic and physical environments, as well as social relations (Davis et al., 2015) which shape and constrain behaviours and practices in response to risk (Sutton, 2003). In addition, the TPB model has been criticised for overemphasising conscious control of behaviour and lack of acknowledgement of unconscious processes in decision making (Wegner and Ingvalson, 2002). For example, emotional response to risk influences the behaviour more than a rational assessment process (which is why people report being more scared of flying in a plane than driving a car even though the chances of car accidents are much higher (Loewenstein et al., 2001)). The model pays little attention to the context within which behaviour change occurs.

The PRECEDE-PROCEED model is an ecological approach to behaviour change similar to that previously outlined by Dahlgren and Whithead's model of health determinants. It combines individual and environmental factors shaping behaviour (Dahlgren and Whitehead, 1991) and thus overcomes some of the above problems. The PRECEDE-PROCEED model also lists tools which can be used to address behaviour through policy, regulation, organisational factors, education and environmental development (Crosby and Noar, 2011). Ecological models have been further extended to illustrate how outcome of a human-dog interaction can be understood as an intersection of layers of factors related to the individual bite victim, dog owner and a dog (Watkins and Westgarth, 2017, Figure 2.1.). In accordance with ecological models, individual behaviour around dogs depends on: the characteristics of an individual person and a dog (e.g. their health, age and sex, their perceptions, beliefs, skills and knowledge); social relations (with other people and dogs); social norms around dog keeping; education regarding dogs; training that a dog received; physical aspects of the environment within which interactions occur; and broader policies (e.g. which may restrict ownership of particular breeds, leash laws, or prescribe particular behaviours around dogs within occupational contexts).

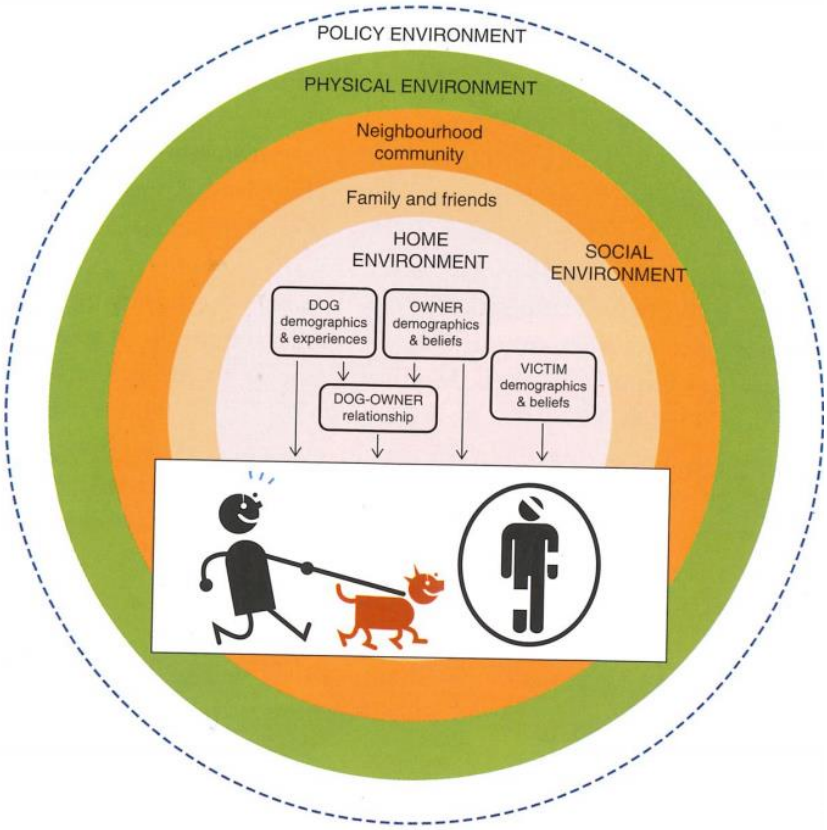


Figure 2.1. *Interplay between determinants of health related to the dog owner, bite victim and a dog (In: Watkins and Westgarth, 2017, p.50).*

Hargreaves (2011) critiqued behaviour scientists arguing that the extension of a basic model where behaviour can be changed through addressing cognitive components (i.e. the perceptions or knowledge) by adding further elements thought to change behaviour was simplistic. He argued this extension continues to depict behaviour change as following a linear process (perception/knowledge → behaviour or perceptions/knowledge + contexts → behaviour), which may not be the case.

The COM-B model aims to synthesise the existing individual and environment-focused sources that contribute to a behaviour, without adhering to a strictly linear narrative (Hargreaves, 2011). The first source of behaviour, capability, is defined as "the individual's (…) capacity to engage in the activity concerned" (Michie, Van Stralen, & West, 2011 p. 4). Capability can be further understood as physical (e.g. physically being able to control a dog) or psychological skills and knowledge (e.g. being able to learn about dog behaviour). The

model therefore accounts for how the physicality of an individual's lived experience may shape their interactions with dogs as well as ability to change.

The second source of behaviour, opportunity, is defined as "all the factors that lie outside the individual that make the behaviour possible or prompt it" (Michie et al., 2011 p.4). Opportunity is also differentiated as social (e.g. the norms that dictate how risk of dogs is commonly perceived, how interactions with dogs are labelled, etc.) or environmental (e.g. where the dogs are exercised). Opportunity can therefore include social networks or social norms (emphasised in social-determinants model of health), but also the physical environment and resources required for the behaviour (often listed in the system-focused models of injury prevention).

The third source of behaviour, motivation, is defined as "all those brain processes that energize and direct behaviour" (Michie et al., 2011, p.4). Motivation can be thought of as reflective process (forming and evaluating plans) and automatic process (which may arise from emotions, individual personality or character, impulse control and prior learning) (Michie et al., 2011). Therefore, motivation includes emotional reactions, such as heuristic biases described earlier, analytical decision-making as well as habits and routines, mentioned by social theorist as important in risk management. The COM-B model recognises the non-linear interaction between the three core components, for instance, the capability can influence the motivation and the behaviour itself can influence or be influenced by the capability.

A number of behaviour change interventions that map onto the above sources of behaviour have been identified (Michie and West, 2013). For example, where behaviour is motivated primarily through social rewards (e.g. it is seen as socially desirable), then ceasing the rewards (e.g. by addressing social norms which make it desirable in the first place) should help extinguish the behaviour. A range of interventions which alter the perception of a behaviour making it appear less rewarding can help to alter social norms, e.g.: marketing, communication, or modelling new behaviour. When a behaviour is inherently rewarding (e.g. eating cake), these measures alone may not be effective and alternative strategies may be needed (e.g. reformulation making portion sizes smaller). The relationship between sources of behaviour and relevant intervention techniques are presented as a wheel (Figure 2.2), to reflect that behaviour change and specific techniques for intervention may be non-linear.

Table 2.2 summarises definitions of the identified techniques (Michie et al. 2011). Following from the COM-B model, to improve dog bite prevention, it is necessary to explore sources of behaviour: how capabilities, opportunities and motivations shape individual practices around dogs and identify specific techniques that are likely to address these.

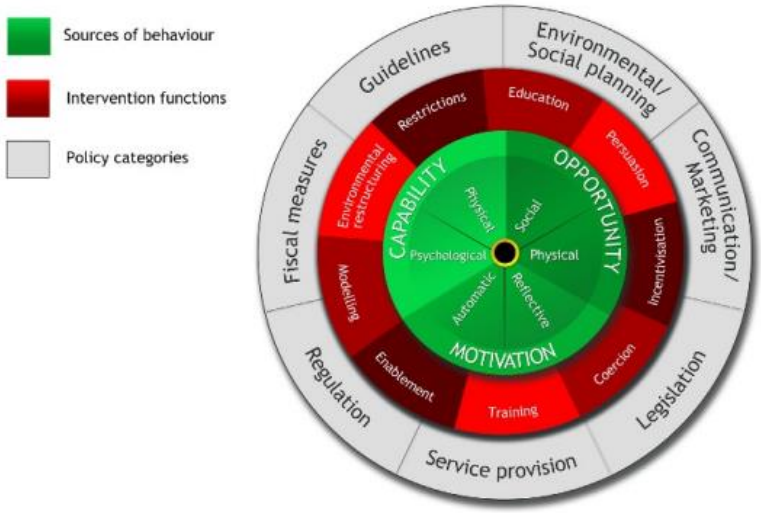


Figure 2.2. *Behaviour Change Wheel (Michie et al., 2011, p.7). Layers of the wheel reflect that sources of behaviour can be changed through different combination of interventions and techniques. In: Michie et al., 2011.*

Table 2.2. *Definitions of techniques and types of policies summarised in the Behaviour Change Wheel model (Michie et al., 2011, p.7).*

Technique	
Education	Increasing knowledge or understanding
Persuasion	Using communication to induce positive or negative feelings or stimulate action
Incentivisation	Creating expectation of reward
Coercion	Creating expectation of punishment or cost
Training	Imparting skills
Restriction	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)

Environmental restructuring	Changing the physical or social context
Modelling	Providing an example for people to aspire to or imitate
Enablement	Increasing means/reducing barriers to increase capability or opportunity
Policies	
Communication/ marketing	Using print, electronic, telephonic or broadcast media
Guidelines	Creating documents that recommend or mandate practice. This includes all changes to service provision
Fiscal	Using the tax system to reduce or increase the financial cost
Regulation	Establishing rules or principles of behaviour or practice.
Legislation	Making or changing laws
Environmental/ social planning	Designing and/or controlling the physical or social environment
Service provision	Delivering a service

2.7 Summary

As this thesis draws on multiple theories of risk, this Chapter aimed to present different concepts of risk and how they may be applied to dog bites. Realist, psychological and socio-cultural models of risk provide a different lens through which dog bites can be studied and can help to explain and contextualise existing bite prevention strategies, perceptions and practices around dogs. Dog bites share many commonalities with other unintentional injuries: perceptions of risk and injuries as well as how social norms and socio-economic factors may impact bite prevention. Different models of injury prevention emphasise the role of the context or individual characteristics in causation of incidents. Understanding of all of these factors and the interaction between them is crucial to develop new ways of preventing bites.

3 Methodology

This research was based on a mixed methods approach which enabled analysis of different types of data and increased the overall rigour of the study by facilitating data triangulation (Carter et al., 2014). In this Chapter, the over-arching methodological orientation, principal methods of data collection and analysis are described. These techniques underpin findings summarised in Chapter 6-9. Chapters 4 and 5 followed different set of data collection and analytical tools, which are outlined within those Chapters and signposted here to provide context to the whole study (Table 3.1).

Table 3.1. Summary of data collection and analysis methods used in Chapters 4-5.

Chapter	Data collection methods	Data analysis
4. Exploration of Perceptions of Dog Bites among YouTube™ Viewers and Attributions of Blame	- Comments underneath 10 YouTube™ videos were chosen for analysis. - Videos were selected to reflect a diversity of bite contexts, victim demographics, variety of dog breeds/types, range of bite severities, and different popularity on YouTube™.	- For nine videos, all comments were analysed; the 10th video had substantially more comments than others so a random 20 pages per year since it was released were analysed. - Thematic analysis was used throughout.
5. Dog bite safety at work: An injury prevention perspective on reported occupational dog bites in the UK	- RIDDOR database entries reported between April 2011 and March 2018 were searched for dog bites. - The reports include victim demographic and occupational characteristics, description of the bite and remedial actions taken by the organisation to prevent future incidents.	- The free text where the context of bites and remedial actions were described was coded to derive descriptive categories. - Victim, context, behaviour before the bite and remedial actions were first summarised with descriptive statistics.

		- To explore patterns of association between victim characteristics, occupation and the circumstances of the bite (actions before the bite and other context variables), cluster identification technique which helps to notice sets of items that often occur was used (Goethals, 2005).

3.1 Methodological orientation

3.1.1 Using symbolic interactionism framework to understand how meaning of dog bites develops

To further explore how people manage risk around dogs in daily life - at work and in other contexts - a qualitative methodology was used. This approach advocates studying social phenomena within naturalistic settings, whilst relying on the broader socio-cultural, environmental and economic contexts that people are situated in to understand their experiences and practices (Green and Thorogood, 2004). Specifically, a symbolic interactionism (SI) framework was adopted. Within symbolic interactionism, objects, behaviours, events etc. do not have an inherent meaning; instead their meaning is subjective and depends on how an individual makes sense of the world (Blumer, 1969). The social world acquires meaning in the course of interactions and the interpretation of these interactions (Blumer, 1969). For example, within SI the meaning of concepts (such as “risk”, “dangerous dog” or “dog bite”) is not seen as universal; objects gain meaning in the course of interactions (Charon and Cahill, 1979). The meaning of these concepts guides human action (Charon and Cahill, 1979), which highlights the importance of understanding perceptions of dogs and dog bites in order to understand how people interact with dogs.

The meaning attached to animals, people, procedures and concepts is shared within a given culture, which reinforces the understanding of these objects and subjects (Blumer, 1969). On the other hand, meaning is also culturally specific and constructed with respect to the local

context of interactions, and shaped by local practices. For example, emotions such as disgust are thought to be universal (Ekman and Keltner, 1997), but whether eating spiders is considered disgusting or a delicacy is culturally specific and dependent on individual preferences (Elwood and Olatunji, 2009).

The meaning of objects is interpreted and conferred in the course of interactions (Charon and Cahill, 1979). Interactions reflect and reinforce the meaning (Charon and Cahill, 1979), but also create opportunities for subversion and change in understanding. In this way, the interactive processes are shaped by and shape wider social structures (Berger and Luckmann, 1991, Schutz, 1967). For example, enacting work procedures reflects the current context-specific understanding of principles on how to act. However, over time, in the course of repetitive practice, even without any technological or contextual changes, the enactment of procedures becomes personalised and adapted; it "drifts" away from the original script (Rasmussen, 1997). As practices change, the new behaviour is "legitimized through unremarkable repetition" (Snook, 2000, p.23) and the meaning of procedures changes. Practices change outside of procedural contexts, in course of repetition, in response to new technologies, science, changing social and physical environment, social relations and cultural trends (Berger and Luckmann, 1991). To reflect the relationship between practice and the understanding of constructs, here meaning of "dog bites", "risk", "risk management" and "dangerous dogs", was seen as immersed within the context of interactions rather than taken to be universal. For instance, it was assumed that the meaning of a "dog bite" may be different among those who work with dogs professionally and dog owners and may depend on individual relationship with a dog. Similarly, in this thesis I avoided defining risk *a priori* in a conventional way, such as: "the probability that a particular adverse event occurs during a stated period of time, or results from a particular challenge" (Royal Society, 1992:2). Instead, risk was seen as defined in the process of formal and informal assessments and through practices of risk management (Veltkamp and Brown, 2017).

A symbolic-interactionist framework was also adopted here as it facilitates understanding of the interactions from multiple perspectives. By using dog bites as a focal event that connects all actors (e.g. the victim, victims' family, dog owners, observers, and a dog), multiple meanings and experiences linked by the bite can be retraced and compared. Traditionally, analysis of social interactions is focused on verbal language, therefore animals are not seen

as legitimate partners of social relations (Sanders and Arluke, 1993). Historically, animals were included in the analysis as *objects* of human interactions – something that people have a perspective on, and do things to, rather than participants of these interactions able to shape their meaning (Arluke, 2010). Sanders and Arluke (2010) argued, however, that capturing the animal's perspective on social interactions is not just possible, but also important. Firstly, inclusion of animals in the analysis is in line with the existing knowledge of animal behaviour and cognition. For example, ethologists have argued that indeed "modern neuroscience makes it impossible to maintain a sharp human-animal dualism" with respect to how behaviour is motivated (de Waal, 2019, p. 50). Claims that human behaviour is driven by reason while animals respond out of instincts (and therefore cannot be considered as interactional partners) reflect Cartesian theory which propels human exceptionalism by emphasising the differences between nature and culture, reason and emotions, humans and animals and seeing these as dichotomous and opposite (de Waal, 2019). Research shows that these distinctions are arbitrary. For instance, corporeal interactions and body language are crucial in fostering empathy and emotions are needed in daily decision making (de Waal, 2019, Damasio, 1996). Secondly, people interact with their pets as subjects, not objects, therefore pets' contributions to interactions need to be considered accordingly (Sanders and Arluke, 2010). Trainers who interact with animals as well as dog owners, typically see them as "aware, planning, empathetic, emotional, complexly communicative, and creative" and as unique individuals (Sanders and Arluke, 2010, p. 379). Sanders and Arluke (1993) argued that animals can be included in symbolic-interactionism analysis through careful observations of their behaviour, appreciation of the context of these interactions, and drawing on research into animal's behaviour and emotions. Therefore, during data collection and analysis, notes on both human and dog behaviour were taken.

3.1.2 Using ethnographic methods to follow risk across multiple fieldwork sites

This study drew on an ethnographic methods, defined as: "an approach to experiencing, interpreting and representing culture and society that informs and is informed by sets of different disciplinary agendas and theoretical principles" (Pink, 2013, p.18). The purpose of ethnographic research is to identify shared patterns of ideas, beliefs, language, actions, practices, understandings in reference to the cultural context of an individual or a group

(Creswell, 2013). Ethnographic methods take a flexible, iterative and responsive approach to the study findings. For example, observations made during the fieldwork of participants can be used to modify questions asked during the in-depth interviews and the preliminary interview findings can help to focus the participant-observations (Creswell, 2013). Ethnographic methods do not preclude any tools of data collections and therefore are also helpful in triangulation of findings. For instance, observations can be compared to formal reports and verbal accounts of human-dog interactions to verify if interactions with dogs are similar to the accounts of these interactions (Carter et al., 2014).

Historically, ethnographic studies were conducted at a single research site to understand how shared environment, history and social relations can explain beliefs, behaviours and interactions of an individual or within a social group within the context in which they occur (Creswell, 2013). For instance, Malinowski carried out fieldwork into the reciprocal exchange system (*Kula)* in Trobriand community by living with Trobrianders and joining them in their daily activities for over two years (Weiner, 1980). Unlike the Kula exchange system, dog bites are not attached to a geographic area or specific social groups. As a quarter of the UK's households keep dogs (Murray et al., 2010) and dogs are walked in public places, anyone can be at risk. Marcus (2011) proposes that as cultural processes and social groups can no longer be understood as geographically bounded entities defined in relation to a single location, a flexible approach to an ethnography is needed. He suggests that when the research phenomena gains meaning across different geographical contexts, ethnography could take a form of a "tracking strategy" (Marcus, 2011, p.95). In this approach, a researcher follows the concept, relations or individuals of interest across different fieldwork sites to explore how the meaning emerges across different contexts and interactions (Marcus, 2011). A multi-sited ethnographic approach is an appropriate investigative method for phenomena that "cannot be accounted for by focusing on a single site" (Falzon, 2016, p. 104). Although the risk of bites is dispersed within the society, the meaning of bites is unlikely to be singular, i.e. the experience and understanding of bites within a work context and outside of work and among the dog owners and non-owners is likely to be different. Consequently, here, "tracking strategy" was used to map alternative meanings of risk and safety and practices associated with these concepts by exploring the perceptions and experiences of dog bites in different contexts (Marcus, 2011, p. 95). The aim of carrying out a multi-sited ethnography was not to

produce a complete record of perceptions of dog bites and relevant practices, but to explore the diversity of partial perspectives (Haraway, 1988) and experiences thus complimenting the symbolic interactionism approach.

3.1.3 Ontological orientation: developing an understanding of partial, situated knowledge

Within the symbolic interactionist approach the reality "out there" is understood to be emerging and taking meaning within a context of situated interactions, i.e. it is not considered to be objective (Blumer, 1969). Here knowledge and practices linked with dog bite prevention and risk management, were not seen as universal, but as context-specific, developed within a "local universality" (Timmermans and Berg, 1997). Local universality describes "the idea that standards, protocols or ontologies are universal only through their ability to be adapted locally" (Enticott, 2012, p. 4). This concept reflects the belief that practices such as those related to managing risk of dog bites need to be locally adapted, as they are performed within context of pre-existing social relations and within physical environments which may promote or restrain some practices (Enticott, 2012).

More broadly, knowledge generated in the course of research was also considered to be partial (Haraway, 1988). This study was carried out within a particular academic discourse, shaped by the study goals, and practicalities of the study, including access to fieldwork sites and relationships with participants formed in the course of the study (Haraway, 1988). Participants' knowledge of dog bites and bite prevention was also seen as partial, to acknowledge that all perspectives are contextually-specific and situated (Haraway, 1988). In addition, in the course of representing perceptions and experiences of research participants, some accounts, perspectives and knowledges are inevitably silenced, while other perspectives remain included (Rose, 1997). Therefore, the process of representation contributes to the development of partial knowledge (Rose, 1997).

3.1.4 Positionality and reflexivity

This understanding of knowledge necessitates acknowledgement of the role of the researcher in the research process. To this end, I reflect here on how my positionality, the process of data collection and analysis shaped this study (Rose, 1997). Positionality was defined here as

my research perspective, personal beliefs, values, experiences and attributes (Rose, 1997). To acknowledge and understand it, I took reflexive notes throughout the study and included them in the analysis alongside fieldwork and interview data.

My motivation for this study was to improve dog welfare. This motivation was based on the belief that a better understanding of perceptions of risk around dogs could improve dog bite prevention, which in turn could help dog owners strengthen their relationships with dogs and reduce the chances of dogs being relinquished to shelters or euthanized. This motivation had influenced the analytical perspective by dictating a pragmatic focus on behaviour change approaches and injury prevention theories.

I have studied clinical animal behaviour, which has shaped my understanding of dogs, their welfare and training approaches. I also like dogs, I volunteered in dog shelters for over 6 years, ran dog training classes and worked with dog owners as a behaviourist on a one-to-one basis. This “insider” knowledge and experience made some interviews challenging as it required negotiating my insider/ outsider status during the fieldwork. For instance, on a number of occasions I identified that participants’ practices around dogs did not help to address dog behaviour problems or even directly contributed to them. In those circumstances, as per the ethics protocol and to maintain rapport, I generally directed participants to appropriate sources of behaviour advice outlined in the interview debrief form and refrained from making further suggestions. My background in dog behaviour also shaped my initial assumptions: at the beginning of the study I believed that owner and victim education into a dog’s body language could aide bite prevention. In the course of this research, as I have discovered how people interact with dogs and what motivates their practice, my view has changed, which is reflected in this thesis. This belief, however, has informed the questions I asked and my focus on understanding how participants interpret dog behaviour.

I lived with a dog with serious behaviour problems and relate to the experiences of dog owners; I am aware how dog behaviour can impact on one’s lifestyle and relationships. I was bitten by a stranger's dog in public. This experience did not make me like dogs less, but it did make me considerably more wary when meeting unknown dogs. In addition, this research has also shaped my perceptions and practices around dogs. Listening to the accounts of many

participants being bitten by dogs, I have become more cautious around dogs I do not know. This clarified the perspective of people who did become fearful around dogs.

My personal characteristics (not being a native English speaker, my age, previous experience of working with dogs and being a woman) shaped my interactions with the research participants and required reflection on the power dynamic between myself- the researcher, and research participants. For instance, in dog shelters I was mindful about how my education in animal behaviour and age (I was older than most employees) have potentially placed me in a position of power in respect to my participants, which could affect participants' interactions with dogs and the way they described their practices to me. For this reason, I did not discuss my background upfront unless asked. I also regularly discussed my practices with my supervision team to explore how my views may shape interactions with participants and dogs throughout the fieldwork in order to keep my practices in check and follow participants lead instead. Simultaneously, I was also similar to most of the shelter staff (female, experience of dog shelters, and affinity for dogs). For example, I was familiar with the shelter jargon and practical difficulties of working with dogs, which helped to build rapport with participants. These similarities made maintaining the outsider status challenging, as I needed to consciously remember to ask participants to clarify terms used to describe dogs and rationale for their practices, even when these seemed obvious to me, to establish *their* understanding. I also needed to be careful not to make assumptions about meanings during data coding. Ongoing discussions with the thesis supervisors during coding, in particular one who does not have prior experiences of working with dogs, were helpful in this context.

By contrast, during fieldwork in the delivery company I was generally much younger than my participants and my background was different to most staff, who were usually middle age men local to the area. Here however, because of these differences, participants sometimes thought that I was auditing their conduct, which had a potential to significantly shift power dynamics and discourage participants from sharing their views freely. To build rapport, I explained my background early on. Before embarking on this research, I knew very little about delivery work and was not aware of the impact of dog bites on workers wellbeing. This made it easier to ask questions. During the fieldwork I found many participants in the delivery company to be outspoken and bitter about their employer, as part of the fieldwork occurred

when the organisation was preparing for industrial action. To gain insights into different perspectives, I conducted several observations and interviews with managers and spoke with some of the frontline staff again on a later occasion.

3.2 Description of study sites

Research took place in the North-West of England as it is a region of the UK with the highest prevalence of dog bites in England and Wales (Winter, 2015) and due to convenience. Data collection occurred between July 2017 and March 2019. References to specific statistics are not provided in the description below as they compromise anonymity of the participating organisations.

3.2.1 Delivery companies

The location of the first set of fieldwork sites were four different depots of two delivery companies. Most of the participant-observations and interviews were conducted with one company. Both organisations operate across the UK and the visited depots were located within urban and rural areas. Depots varied in the number of staff working in each location. In both organisations, majority of employees were men with a long history of employment within a given company.

3.2.2 Dog shelters

The second fieldwork sites were three dog shelters run by two different organisations. Shelters were located in different locations (rural and suburban) and differed with respect to the number of staff and volunteers, number of dogs cared for, operational budget and the way in which they acquired dogs. In addition, shelters had different policy regarding euthanasia. Two shelters adopted a no kill policy, meaning that dogs were euthanised only in exceptional circumstances when their illness or behaviour problems had a significant impact on their welfare and quality of life and could not be ameliorated through veterinary treatment or behaviour counselling. The other shelter euthanised dogs that were ill, dogs that were assessed to be dangerous (to other dogs or people) and occasionally, due to lack of space in

kennels. In all shelters majority of employees were female and in all shelters the average age of employees was lower than within the delivery companies.

As common in qualitative research (Creswell, 2012), access to each fieldwork site was negotiated through a gatekeeper, with whom the supervision team was familiar with ahead of the beginning of the study (see Figure 3.1 for a summary of organisations where fieldworks was conducted).

3.2.3 Health and Safety Executive

I also spent 5 weeks with the Health and Safety Executive (HSE) UK. In part, this was in order to meet the requirements of my studentship funding. The HSE produces research regarding safety; collects data on incidents at work; facilitates development of policies and guidelines that fit with the Health and Safety and Work Act 1974; and investigates work-related incidents, potentially leading to prosecutions.

3.2.4 Dog owners and bite victims

In addition to people who encounter dogs at work, dog owners and bite victims bitten outside of work were also recruited. Some of the interviews included joining them on walks with their dogs in local parks.

3.2.4.1 Number of recruited participants and participants' characteristics

In total, this study is based on 47 interviews with 50 participants (more than one person participated in some interviews and 2 interviews were added to the data pool from a previous study, Westgarth and Watkins, 2015). Twenty-two participants took part in focus group discussions (8 at the Dog Shelter A, 10 at the Dog Shelter B and 4 at the Dog Shelter C). A total of 47 participants were observed; 31 of them were also interviewed or took part in focus group discussions. Of all participants who were interviewed, 28 (52.8%) currently owned a dog and 25 (47.2%) did not. A total of 32 (60%) women and 23 (40%) men were interviewed. This is a relatively high percentage of male participants, given that women tend to volunteer more often for qualitative studies than men (Robinson, 2013). This percentage of male

participants is the result of uneven gender balance in delivery companies as well as purposeful sampling of participants bitten outside of work towards male inclusion. Overall, 23 (40%) participants who took part in interviews were recruited at work and 32 were recruited (60%) outside of a work context. Most bites reported in the course of interviews (n=24, 45%) occurred less than 5 years prior to the interview, 6 (11.3%) occurred between 5-10 years before the interview and 9 (17%) bites occurred over 10 years ago. The average age of participants was 39 and the age range was 7-71. A summary of information about participants who were interviewed is included in Appendix 1.

3.3 Ethical considerations

This study was approved by the University of Liverpool Research Ethics Committee (project number: 1497). Addition of the two extra interviews from a previously published study (Westgarth and Watkins, 2015) was also approved by the University of Liverpool Research Ethics Committee (the ethics amendments number: IPHS-1112-012). All participants were informed about the purpose of the research and gave written consent before focus-group discussions, interviews and audio-recordings of conversations during participant-observations. Written, or when not possible (e.g. because a person was encountered in the rain, outdoors, whilst walking), verbal consent was also obtained for participant observations and to collect any documents which were analysed.

To obtain informed consent, participants were provided with the Participant Information Sheet. Children, who joined parents in an interview were given a written age appropriate consent form and Participant Information Sheet, which was additionally discussed with them to check for understanding ahead of interviews. Where children were joining parents for the interview, parental assent for child participation was also sought ahead of the study. Participants recruited through work were typically given this information on the same day as their interview, participants recruited outside of work were emailed the sheet ahead of time. Before the interview began, participants were asked to read the Consent Form, which provided a summary of points raised in the Information Sheet and asked for the consent to be interviewed, audio recorded and for the anonymised data from interviews to be used in research and publications. Before signing it, the purpose of the study, structure of the interview and the principles of data anonymization and storage was briefly discussed,

reiterating participant's rights to withdraw at any time. Participants were encouraged to ask questions and raise any concerns before they decided to sign the Consent Form (see Appendices 3, 4 and 5 for the Participant Information Sheets and Consent Form templates).

Decision-makers from all organisations (Heads of operations/ Heads of health and safety/ General Managers and local Branch Managers) granted written permission to carry out the study within their premises.

Experience of being bitten or observing someone else being hurt by a dog can be traumatic; consequently, being interviewed on this subject could bring back the distressing memories. Equally, living with a dog with behaviour problems can be stressful (Buller and Ballantyne, 2020), and sharing these experiences may be unpleasant. For this reason, after interviews, focus group discussions and participant-observations, participants received a debriefing document, which provided them with a list of contacts that may be useful in case of being bitten by a dog or having a dog that has bitten, seeking help for dog behaviour problems, in case of pet bereavement and the researchers' contact details (See Appendix 6).

Participants volunteered to take part in this study, which safeguarded those not able to talk about their experience from doing so. Throughout the interviews and during focus-group discussions, I was mindful of participants' behaviours and the ease with which they were sharing their experiences. Participants were reminded that they do not need to answer a question if they do not want to and that they can stop and withdraw from the study at any point, without prejudice. When participants appeared distressed, I also paused an interview and asked whether they wish to continue. During this time, I did not record the interview or make notes.

3.4 Participant recruitment

The aim of participant recruitment was to strike a balance between being informed by multiple fieldwork sites and reaching the point of thematic saturation (interviewing until no new themes were emerging (Fusch and Ness, 2015)). A combined sampling strategy was employed: purposeful sampling was used to identify participants with diverse experiences in relation to the research aims,) (Robinson, 2013) i.e. exploring the experiences and perceptions of dog bites and practices related to managing risk and negotiating safety around

dogs (see Chapter 1 for the summary of aims and objectives. Consequently, participants with different experience of dog bites, dog ownership, duration of employment (if bitten at work), gender, age, severity of bites and socio-economic status were recruited. Heterogeneous sampling was chosen as selection across diverse experiences means that observed patterns are more likely to be a widely generalizable – and thus suitable for policy recommendations – than if sampling focused on homogenous experiences (Robinson, 2013). In addition, within each workplace, a snowball sampling method was used to identify more participants (Creswell, 2012). Snowball sampling helped to recruit participants immersed within a shared local universality, which in turn enabled exploration of shared experiences of selected work-based communities.

Within each organisation, the study was advertised through internal posters and during morning briefings and with the help of local managers and gatekeepers who also suggested the initial participants who expressed interest in the study. The researcher then approached these participants to discuss the study, seek their consent and arrange an interview or participant-observations (see section 6 for description of procedural ethics).

Outside of organisations, the study was advertised through the university intranet, social media and posters and advertisement in areas frequented by dog owners and non-owners alike- e.g. parks, pubs, community centres, laundrettes, grooming salons, vet practices, and word of mouth. Participants made contact with the researcher, at which point they were provided with the Participant Information Sheet (Appendices 4 and 5) and a brief questionnaire where they were asked to briefly explain the context of the bite and their demographic information to help decide on their suitability for the study.

3.5 Data collection

To facilitate triangulation of evidence and access to participants (not all of whom had time to be interviewed), multiple methods of data collection were used:

- participant-observations (i.e. observing and joining participants during their work routines and unscripted, spontaneous conversations during observed work, audio recorded where this was feasible and where consent was granted);

- in-depth semi-structured interviews (i.e. interviews guided by short open-ended questions); and focus-group discussions (i.e. discussions between employees of the same organisation, guided by a short list of questions; Creswell, 2012).
- Documents were also collected (see Section 8.5.4 for details).

In addition, analysis conducted in Chapter 4 and observations regarding the role of perception of dogs in identifying risk in dogs also influenced in-depth interviews and participant-observations conducted later.

3.5.1 Participant-observations

Participant-observations (P-O) in the Delivery Company 1 were conducted over 10 days. The aim of these observations was to study work practices of a number of staff in-situ at the delivery depots. P-Os were carried out at each stage of mail and parcel processing and delivery to understand the sorting and delivery process, but also in vehicles, when driving between depots, during safety briefings and presentations. The P-Os, were focused on observing and talking about perceptions of dogs and risk at work as well as practices involved in delivery of mail, and observing customers and dogs on the delivery round. During P-Os, participants also spontaneously commented on the work politics, relationships with colleagues and work policy-based regulations.

In dog shelters, managers, kennel assistants, behaviourists, veterinarians, veterinary nurses, and back-office staff (e.g. volunteer coordinators, call centre staff) were observed over a total of 4 weeks. P-Os were carried out during: dog's admission to the shelter; initial behaviour assessments; daily exercise; socialisation and training sessions; medical examinations; rehoming, and; euthanasia. In addition, P-Os were conducted during lunch, when staff socialised, and during staff training sessions. During P-Os I also helped with cleaning and preparing meals for dogs and took dogs out for their daily walks myself. Notes were made on the behaviour of dogs, how they responded to people, as well as practices of shelter workers and their perceptions of dogs and risk. In the course of P-Os, methods for assessing dogs, ways of understanding and identifying risk, relationships with dogs and experiences of bites were discussed. These conversations were used to generate questions for the later focus group discussions.

In addition, P-Os were conducted at the Health and Safety Executive over one month during the placement hosted by the organisation. Originally, the aim of the P-Os was to follow inspectors in investigations of dog bites. Upon arrival, I was informed that these investigations are not routine, in fact inspectors had only investigated one bite which occurred in exceptional circumstances. HSE colleagues told me that most dog bites experienced at work were not considered as incidents which could be prevented through best-practice guides or legislations within the control of HSE. Consequently, focus of P-Os shifted to conversations with inspectors regarding their perception of incidents, their understanding of the health and safety legislation, and expectations on employers to keep their staff safe within the context of bites. P-Os were also conducted with policy makers, human-behaviour change consultants, economists, ergonomists and human-error advisors to explore how behaviour within a work context can be modified. To further understand the operations of HSE, I also participated in meetings on other ongoing research areas and policies (e.g. musculoskeletal health linked with lifting) and developed my own research project. The aim of the project was to analyse the RIDDOR database, to identify occupational and context characteristics of dog bites at work as well as remedial actions taken by the organisation (See Chapter 5).

Written, and where not possible, verbal informed consent was sought ahead of participant-observations whenever feasible. Where consent was not obtained (e.g. because a person entered the room and it was not appropriate to interrupt a meeting to explicitly seek their consent), notes were not taken. Notes from P-Os were jotted down throughout the day and often supplemented with audio recordings, which were later transcribed to compliment the hand-written notes. Names and locations were omitted from notes and pseudonyms were used instead. At the end of each day of observations, notes were revised and annotated with reflections on positionality, research process, further ideas and possible theoretical connections. Anonymisation of P-Os is explained further in 3.6.2.

3.5.2 Interviews

All in-depth interviews were performed in a quiet, private space identified by the participant (their workplace, while walking their dog, over the phone or at the University of Liverpool). Three interviews were conducted over the phone. All interviews lasted between 31 and 227

minutes. All interviews were audio-recorded and reflective notes were written afterwards. Interviews were transcribed and anonymised in the course of transcription (details of anonymisation process are described in section 3.6.2). Interviews followed an interview guide (See Table 3.2 for a summary and Appendix 7 for details). Additional questions were also asked to clarify participant-observations, if these had been conducted previously. The interview guide consisted of several questions aimed to put participants at ease first (e.g. Did you get here ok?). Subsequently, participants were asked to describe what happened before, during and after the bite. If participants were bitten multiple times, they were asked to describe the bite they considered as most serious first. Notes were taken throughout the interview to aide asking clarifying questions and regarding comments offered by the participants during interviews.

3.5.3 Focus-group discussions

After obtaining additional ethical approval, focus group discussions were conducted at each of the shelters, as staff found it difficult to find time for individual interviews. Questions were designed to resemble questions posed during one-to-one interviews and in response to insight from P-Os thus facilitating triangulation of individual accounts (Matthews, 2005). For the summary of questions, see Table 3.2. All focus-group discussions were carried out at the participants' workplace and after participant-observations and were transcribed and anonymised.

Table 3.2. *Example of interview and focus group discussion questions (for the full interview schedules, please see Appendix 7). Questions asked only during interviews conducted within a work environment are marked with a *.*

Interviews	Focus group discussion

• **How did you start working here?*** • **What do you like the most about your job?*** • **What, if any, are the biggest risks in your day to day work?*** • **Can you tell me about a dog you currently have or had in the past?** • **Can you tell me about the time you/ your child were bitten by a dog?** • **Can you tell me about what happened after the bite and what impact, if any, did it have on you and your child?** • **How, if at all, did a bite affect your work?*** • **How do you tell when it is safe to interact with your dog/ with a dog?** • **How do you tell when it is safe to interact with a dog at work?*** • **Is there anything that you do to stay safe around dogs? If so, could you give me an example of something that you do?*** • **How do you teach someone to be safe around dogs at work?*** • **Why do you think you were never bitten? (for those who were never bitten)** • **In your opinion, what are the reasons for dog bites?**	• Has anyone here been bitten by a dog? • Are there any dangerous aspects of your job? If so, what are they? • What happened when you were bitten by a dog? • How, if at all, do you prevent bites at work? • How do you teach someone to be safe around dogs at work?

3.5.4 Document analysis

In addition, internal policy documents and training documents which aimed to regulate behaviour of staff to prevent bites, or monitor or regulate risk at all organisations were also collected and analysed. The documents were identified by asking staff within workplaces to access these guides. Example of these include posters, leaflets, notices, training documents, and mentoring guidelines.

Additional documents were identified in the course of fieldwork with HSE. Examples of these include the Health and Safety at Work Act 1974 and documents clarifying how to implement

it, best practice guidelines on safety at work for employers and staff, and research briefings on modifying human behaviour at work. These documents are publicly available and were accessed through an online search.

3.6 Analysis

As common in qualitative research, data analysis was carried out concurrently with data collection (Green and Thorogood, 2004).

3.6.1 Data transcription

The choice of transcription method is an important step in data interpretation because transcription reflects a decision about how participants will be represented in the study, as well as a researcher's input into data collection (e.g. through asking particular questions, Bird, 2005). Here, a semi-denaturalised transcription style was used; elements of communication and interactions that modify the meaning of speech (such as laughter, long pauses, and changes in pitch) were retained, as were interviewer questions, interventions and comments. Professional transcription services were used to transcribe all but two interviews, and audio-recordings from participant-observations were transcribed by the researcher. The researcher verified the transcript against the recording before the analysis.

3.6.2 Data anonymisation

The interview, focus-group discussions and P-Os data were anonymised when making notes and during transcription. Anonymization was carried out by removing identifiable characteristics. Names of organisations, places, hospitals, individuals and their dogs were removed and replaced with pseudonyms where suitable. In addition, for presentation in quotes rare breeds of dogs and details of injury, if the injury was atypical or rare, were also anonymised. Documents, leaflets, posters were anonymised and in analysis, these are described rather than shared in an original form as their branding is often characteristic. If the research team was not certain that the case was sufficiently anonymised, it was disaggregated and integrated with other cases to protect the identity of interviewees.

3.6.3 Qualitative coding and analysis

Visual material (e.g. safety posters) were treated as equally important to the textual material and analysed alongside it. Reflective notes as well as notes from participant-observations and transcripts were all included in the analysis, to reflect the idea that researcher is co-constructing knowledge (Timonen et al., 2018) and how knowledge is situated (Haraway, 1988).

Analysis was carried out on an iterative basis and concurrently with data collection, as common in qualitative research (Green and Thorogood, 2004). The first stage of the analysis included familiarisation with data, i.e. reading through printed notes or transcripts, and making free-hand notes. Data were then coded in two cycles (Saldaña, 2015). Codes were developed quasi-inductively: the research objectives and theoretical literatures on risk being discovered by the researcher concurrent with conducting analysis helped to narrow down the coding framework that was emerging from the data and what information was coded, whilst codes were assigned to best summarise the content (Saldaña, 2015). Data was coded line by line. The first cycle of coding was conducted on paper; descriptive codes were developed and memos and theoretical ideas were noted in a separate computer file. At this time, coding was regularly discussed with the supervision team to ensure rigour. Codes were then compared between different fieldwork sites, which was the departure point to the second cycle of coding (Saldaña, 2015). During the second cycle, qualitative data analysis software (NVIVO) was used (Castleberry, 2014). During the second cycle of coding, the existing descriptive codes were continuously revised and consolidated to identify analytical codes and reflect new data. These codes were then compared and grouped together to identify the main themes, i.e. over-arching theoretical insights that capture the underlying concepts (Braun and Clarke, 2014).

4 Exploration of perceptions of dog bites among YouTube™ viewers and attributions of blame

This Chapter has been published in Anthrozoös, a peer reviewed journal focused on human-animal interactions (for the published version, please see Appendix 11).

4.1 Introduction

Most studies into dog bites focus on epidemiology of bites, i.e. on developing an understanding where and when bites take place and what the characteristics of the victims and the dogs are (Overall and Love, 2001). However, to improve bite prevention, a deeper understanding of the ways in which people perceive the risk of dog bites, e.g. how their understanding of dog and human behaviour and their environmental influences shape the way they identify and manage this perceived risk is needed. Understanding of perceptions is important, as personal attitudes and perceptions can impact behaviours directly (Ajzen, 1991) or indirectly, by affecting motivation to engage in behaviour (Michie et al., 2011), including behaviours around dogs. In addition, perceptions reflect and contribute to social norms, which in turn shape social opportunities which impact on behaviour (Michie et al., 2011). Therefore, greater knowledge of societal and individual attitudes regarding dog bites may help to inform how best to prevent them.

A range of factors shape how people understand and predict dog behaviour (e.g. Tami and Gallagher, 2009, see Introduction and Chapter 1 for detailed review , Wan et al., 2012). Breed familiarity was identified as among the most significant factors shaping perceptions as breed can modulate the perceived risk an individual dog of that breed presents. In short, previous studies suggest that peoples' perceptions of breeds/ dog types are affected by their prior knowledge and experiences with dogs and the dog's visual characteristics (Gunter et al., 2016, Clarke et al., 2013, Wells et al., 2012).

Studies suggest that people perceive and understand dog bites and severity of a bite in different ways, making it difficult to identify universally applicable prevention strategies. For example, a study of female dog bite victims found that there was not a single definition of a bite (Westgarth and Watkins, 2015). Moreover, in an ethnographic study, practicing vets

often re-construct minor bites as "just nips" and in some cases, deny being bitten even when a bite was observed (Sanders, 1994, p. 52). Victims can rationalize bites as “just one of those things”, something expected when interacting with dogs, reflecting a degree of acceptance and apathy regarding dog bites (Westgarth & Watkins, 2015, p. 486). Furthermore, dog owners and dog professionals alike often rationalize aggressive behaviours of dogs and, depending on the context in which it was shown and an owner's relationship with a dog, can see it as justified (Orritt et al., 2015).

As discussed in Chapter 2, risk and blame have to be understood together, as defining blame is a part of a process of justifying why something poses a risk (Douglas and Wildavsky, 1983). Previous research indicates that bite victims rarely blame the dog- they blame themselves or the owner instead (Westgarth and Watkins, 2015). Tracing how blame is attributed helps to provide insight into bite perception, as to ascribe blame it is necessary to define a causal relationship between different actors- a process by which A harms B (Douglas, 1992).

The cultural theory of risk and blame proposed by Mary Douglas and her collaborators informs analysis presented in this Chapter. Briefly, I draw on an idea that the identification of risk always reflects what a society or a group perceives to be at stake (Douglas and Wildavsky, 1983). Consequently, the process of risk identification contributes to defining what is acceptable, valuable and normal and a way of reinforcing these norms by regulating risks and identifying those who can be blamed for them (Rescher, 1982).

The aim of this study was to further explore how individuals interpret and give meaning to why they thought dog bites happen, by using YouTube™ videos of bites and the comments left under the videos.

YouTube™ is a video sharing platform that has previously been used to explore users’ perceptions of dog behaviour (Burn, 2011, Preston et al., 2013) and to study human-dog interactions (Payne et al., 2016, Salgirli Demirbas et al., 2016). YouTube™ offers a unique opportunity to observe actual bites and, although not all YouTube™ users comment on videos, it presents a chance to study diverse perceptions and interactions that the video provokes. Analysis presented in this Chapter was guided by two questions:

1. What are the perceptions of risk in YouTube™ users’ comments?

2. How, if at all, do YouTube™ viewers attribute blame for the bites?

Comments left underneath YouTube™ videos of dog bites were analysed here to explore what viewers identify as risks during human-dog interaction and how they assign blame for a bite, and discuss findings with reference to the cultural-symbolic theory of risk and blame.

4.2 Methods

YouTube™ videos of dog bites were identified using search terms: “dog bite”, “dog attack”, “dog bites baby”, “dog bites man”, “dog bites woman” and “kid gets bitten”. The identified videos were then checked to ensure they depicted a dog bite to a human (defined here as dog holding a person’s body part in the mouth and applying visible pressure, reflected in e.g. the person’s vocalizations or facial expressions indicative of pain). One hundred and forty three videos met these criteria. A study describing circumstances of bites and human-dog interactions preceding a bite based on the analysis of these videos has been published separately (please see: Owczarczak-Garstecka et al., 2018). Ten videos were chosen for qualitative analysis using purposive sampling to reflect a diversity of bite contexts, victim’ demographics, variety of dog breeds/ types, range of bite severities and different popularity on YouTube™ (for a summary of videos, see Table 4.1). For 9 videos all comments were analysed; the 10th video had substantially more comments than others so a random 20 pages per year since it was first listed on YouTube™ were analysed. All comments were included in the transcripts, including the ‘trolling’ or ‘hating’ comments which often did not relate to the video. Trolling/ hating comments are spiteful comments usually left to provoke other users (McCosker, 2014). They were included in the analysis as they provided a context for the interpretation of other comments. Comments were ordered chronologically and comments posted until March 2016 were included.

Table 4.1**.** Summary of YouTube™ videos of dog bites analysed (comments count and thumbs up/ down noted in March 2016).

Description of video	**Thumbs up/ thumbs down**	**Comments/ views**

Two large dogs attacking a man outdoors. The male victim is bitten in face, arms, legs and abdomen. A number of spectators try to break up the attack, unsuccessfully. One of the dogs attacks one of the spectators.	255 up 64 down	354 comments 541 376 views
A toddler is running around a dog and hitting it with a broomstick. The dog approaches and backs away from the child throughout the clip and bites child's t-shirt and his back. Throughout the clip adults can be heard laughing and talking.	54 thumbs up 119 thumbs down	111 comments 17704 views
A man is standing with a large dog on the lead. Another man approaches the dog and the dog bites his arm and pulls, shaking its head. The man tries to break away from the dog and makes a kicking movement towards the dog. A third man appears and separates the dog from the victim with a stick.	321 thumbs up 82 thumbs down	140 comments 463340 views
The video is filmed inside a flat. A dog trainer interacts with a small dog in the corner of the flat and the dog bites the trainer.	1003 thumbs up 54 thumbs down	264 comments, 373 981 views
The dog is mounting the visitor and when the owner tries to pull him away by holding his collar, he jumps up and bites owner's face.	104 thumbs up 17 thumbs down	53 comments 49756 views
Two boys are playing with a large dog in the garden. One of the boys falls over and the dog bites his hands and legs. The person behind the camera is heard laughing. A woman comes out of the house and pulls the dog away from the boys.	27 thumbs up 38 thumbs down	82 comments 20249 views
A police officer is walking the dog through the crowd near a street demonstration. The dog jumps up and bites a passer-by.	18 thumbs up 26 thumbs down	158 comments 24444 views

A large dog is lying in the corner. A toddler is crawling, touching the dogs' legs and vocalizing. The child pulls on the dog's tail and starts climbing onto the dog. The dog growls and bites baby's head.	11 thumbs up 24 thumbs down	74 comments 42801 views
A teenager is kneeling on the floor and slapping dogs' scapulae with left/ right hand in quick succession. The dog is heard growling and bites the boy's hand.	9 thumbs up 19 thumbs down	19 comments 10080 views
A man is squatting next to the dog, petting the dog on the top of the dog's head. The dog handler is kneeling next to them. The man turns to face the dog and puts both hands on the dog's neck, leaning closer to the dog. The dog jumps up and bites his face.	4366 thumbs up 680 thumbs down	6265 comments 4,729,849 views

Thematic analysis was deemed to be the most suitable method of data analysis as through the process of systematic data coding the key themes around users' interpretations of videos and perceptions of risk and blame can be identified and summarized (Braun and Clarke, 2014). This type of analysis encourages a flexible approach to defining codes and developing themes (Braun and Clarke, 2014), which was seen as advantageous, given that little theoretical work has been done on working with YouTube™ data.

Analysis was conducted using NVivo software (Castleberry, 2014). To identify key themes within the comments, a third of all comments across all videos were first coded with latent codes, i.e. codes that relate to underlying ideas and patterns, line by line. The codes were reviewed, compared and summarized and a conceptual coding framework was developed. This framework was applied to all of the data in a recursive manner, reviewing and modifying the framework during the coding process. The prevalent ideas were finally summarized under common themes (Ryan and Bernard, 2003) which was defined as relating to the research questions and capturing an important pattern within the data rather than expressing simple frequency of occurrence (Braun and Clarke, 2014).

4.3 Ethical statement

All videos were in the public domain and were used in accordance with YouTube™ regulations. Therefore ethical approval from the University Ethics Committee was not required for this project. Prior to the analysis, usernames and other elements that could facilitate individual user identification were removed from the document. To protect anonymity of users who would not be able to give consent to be a part of this study, instead of providing links to the videos, the content of the videos is summarized in Table 4.1. A number of videos were distressing to watch. To safeguard myself from emotional harm, I took frequent breaks while watching the footage and discussed the content of videos with my supervisory team. In addition, I made sure I regularly interacted with familiar, friendly dogs to counterbalance the negative feelings about dogs experienced whilst watching YouTube™.

4.4 Findings

Six key themes that illustrate viewers' perceptions were identified: "the nature of a dog", "controlling dogs", "breed determinism", "bad owners/bad parents", "blaming the victim" and "normalizing bites". The themes are presented in Table 4.2 and discussed below. Risk identification and blame attribution are considered jointly as they were connected in viewers' comments and often used to justify one another.

Table 4.2. Summary of the coding framework.

Common theme	Sub-themes
1. The nature of a dog	Dog as a wild animal
	Lack of agency
	Not blameworthy subjects
	Idealizing dog's nature
2. Controlling dogs	Training and socializing
	Trained not to be pets
3. Breed determinism	Gene as determining behaviour
	Faulty genes

	Breed as appropriated/ abused
	Personal experience
4. Bad owner/ bad parent	Lack of knowledge to control the dog
	Lack of skills to control the dog
	Lack of physical strength to control the dog
	Lack of awareness of what the dog is doing
	Personality of the owner impacts the dog
	Poor supervision
	Lack of control over the child
5. Blaming the victim	Lack of knowledge of dog behaviour
	Behaviour caused the bite
6. Normalizing bites	Questioning risk
	Bites as normal

4.4.1 The nature of a dog

It was clear from the comments that viewers acknowledged that dogs were a source of risk but rarely blamed them for the bite. Most viewers believed that dogs are inherently good-natured. For example, dogs were often described as “amazing and caring”, “loyal”, “clever”, “loving”, and “pure”. Adult dogs were often referred to as “puppies” and viewers argued that dogs are noble and deserve respect. However, what it is to be a dog is dichotomized into two parts: when explaining a bite, viewers pointed out that dogs are also “*just animals*”, “*descendants of wolves*”, “*driven by instincts*” and argued that the wild side of dogs, which is out of their control and distinct from their positive nature, is a reason for bites. However, in conflict with this perception most viewers simultaneously did not see a bite as a behaviour that a dog wants to perform. They referred to a dog’s body language (e.g. being still or tense, not wagging the tail, tuning away from the person) to argue that dogs do whatever they can to avoid biting. There was a mostly positive view of dogs and the conflicting perceptions that dogs both lack agency over their biting behaviour, and do have control and try not to do it, were the basis for deflecting blame for the bite away from the dog.

4.4.2 Controlling dogs

Some viewers argued that through appropriate training and socialization the wild side of dogs could be brought under control. Training and socialization were therefore seen as a crucial part of dogs' enculturation into human life, i.e., a process by which dogs learn the requirements of living within human culture and behaving in a way that is congruent with its norms. Training and socialization were perceived as social practices that give dogs agency and control over their behaviour, if done correctly. However, viewers disagreed over what are the appropriate training and socialization methods and saw some approaches, in particular where a dog was treated like a person or a toy, as inappropriate. One viewer commented:

"Retards who get chuhuahuas [sic] always treat them like toys instead of living animals, so they always end up acting vile since they've never been taught how to behave."

Moreover, the effects of training were thought to be reversible and training was often discussed as something that needs constant work. For instance, one user said: "*its a animal, left untrained it will become a wild animal"* and another user added:

"*you need to train that rat over and over again and the moment it slips you need to get back at it or they turn nasty."*

Safety of dogs was therefore seen as only temporary (as long as they were well trained) and control over them was understood as a dynamic process, a practice that requires constant work to be maintained.

4.4.3 Breed determinism

All breeds or types of dogs that viewers recognized were stereotyped. For instance, some viewers thought that Chihuahuas were aggressive because breeding for a diminutive size compromised the dog's temperament. However, most of the time the stereotypes were used to shift the blame away from a dog and to attribute it to the victim or owner who was thought to be at fault for not knowing about the breed predispositions. For instance, one viewer said:

"(…) what idiot walks in front of a agitated German Shepherd. That's like grabbing an electric fence, you don't (…) do it."

Blaming dogs for a bite was rare and only occurred when the viewers thought that the dogs involved were Pit bulls or Pit bull types. For these viewers breed was a limit to how much they thought a dog can be controlled through training, and their behaviour was often discussed as inflexible, pre-determined by their genetics and history of being bred for fighting. For example, one viewer commented:

"Pit Bulls - all of them - are notoriously vicious and hateful. I'm real tired of the owner/breed theory. They attack people until they are mauled, and are proud of what they've accomplished (...)"

Some viewers argued against these stereotypes by sharing stories of owning or interacting with a pit bull that was *"a big softy"* and "*would never hurt a fly"* even when provoked.

4.4.4 Bad owners, bad parents

Even though the viewers generally recognized the dogs as the source of the bite risk, they usually blamed the owners or victims for bites. Owners were blamed when they were perceived as unable to control a dog, lacking the knowledge or awareness of the dog's behaviour or having inadequate physical strength to control the dog. For instance, one viewer said:

"If that owner didn't see that coming... incredible....He should have instructed the reporter how to approach the dog, as he is supposed to know how these dogs react to certain behaviour".

Owners who also appeared to be the parents of the children bitten in videos were additionally identified as bad parents and blamed for the bite even if the bite was also thought to occur due to the child's behaviour:

"This is completely the parents fault not the dog!!! Why are u allowing ur [sic] child to climb on the fkn dog to begin with this is not appropriate behavior but it is appropriate for the dog to nip n say get the fk [sic] off me (…)!!!"

This viewer lists several behaviours that they thought the child did to cause a bite, they attribute blame for the bite to the parents. Viewers blamed the parents for not controlling the child around the dog, not controlling the dog or simply allowing the interaction to carry on for too long. For instance, a number of bites to children observed were perceived to occur during 'play'

between the dog and child, and although viewers argued that play bites were not serious and could not cause harm, they still thought that parents should have prevented play bites or interrupted the child-dog interaction earlier.

4.4.5 Blaming the victim

Victim's behaviours such as being too close to a dog, walking directly towards a dog, not allowing a dog to have space and touching a dog's neck, throat or top of the head were thought to show that a person lacked knowledge about dog behaviour, or wilfully ignored it:

"You have to be really stupid to walk up to a dog on a leash the way he did and start petting it".

Victim behaviours were often discussed as the reasons for a bite. A person showing these behaviours was identified as a cause of the risk and blamed for causing a bite. Furthermore, viewers felt these behaviours to be disrespectful to the dog and perceived the ensuing bite as inevitable and a lesson to learn from. For example, one viewer said:

"*You can't blame dog, the [person bitten] deserved what he got"*

4.4.6 Bites as a normal part of human-dog interactions

Viewers downplayed the risk of bites in some contexts, in particular play. One viewer said:

"[B]basically if you want to play with dogs or even act like an alpha dog, you have to be able to take a bite now and then".

Play bites were often perceived as a normal and permitted part of human-dog interactions. Viewers felt that what they observed was "*not an aggressive bite*", which suggests that viewers downplayed these bites.

In addition to defining the risk of play bites as low or acceptable, the legitimacy of the risk posed by biting dogs in contexts other than play was also questioned. This is seen in the language users used to describe bites, for instance, some were referred to as 'nips' or 'nibbles'. Bites in other contexts were also sometimes normalized. For instance, bites that followed from interactions with dogs that were thought to have received specialist training (e.g. for protection or police

work) were said to be expected and fair as the dog was perceived to be doing what it was trained for. Some viewers argued that bites by trained dogs are normal, even if they occur outside of the context for which dogs were trained to bite. Other viewers opposed this view saying that regardless of the specialist training that the dog received it is not acceptable for them to bite outside of these contexts and the owner should always be able to control the dog's behaviour in public.

4.5 Discussion

In this study, comments written in response to ten YouTube™ videos were analysed to explore the perceptions of risk in human-dog interactions and the way blame for bites was attributed.

Dog bites are a result of multitude of factors such as dog and human behaviour, their history, knowledge, and the environment in which the interactions are taking place (Mills et al., 2012) and therefore may be hard to predict. For example, a dog that frequently interacts with a child safely may bite the same child in a course of routine interactions, if for instance, it experienced something distressing prior to meeting the child (e.g. loud noises). Dog and human behaviour as well as the environment within which the interactions are occurring could potentially be used to explain why the bite took place. However, here it was observed that YouTube™ users focus primarily on a person's behaviour around the dog, and how child-dog interactions are supervised, but with some allowance for the dog's nature, breed, training and socialization. The comments on YouTube™ reflect therefore what viewers perceived as important risks in human-dog interactions (Douglas & Wildavsky, 1983). Risk of bites and attribution of blame for bites was perceived in a reductive manner and becomes seen as more concrete, predictable and well understood, than they may actually be. For instance, dogs that were trained and socialized were perceived as safe and those that lacked training were perceived as a risk. Perception of risk was also aligned with dog breed, whereas evidence suggests that within-breed variation in behaviour is substantial (Mehrkam & Wynne, 2014), and thus using breed to predict risk may be inaccurate. In particular, Pit bulls were perceived as more aggressive than other breeds. This is potentially because historically, within the Western media this type of dogs have been described as hyper-aggressive, vicious and demonic more often than other breeds (Cohen & Richardson, 2002, McCarthy, 2016). Viewers' reliance on breed stereotypes could lead to a greater acceptance of dangerous

behaviour in some dogs. This is problematic as a delay in behaviour intervention often means a poor prognosis for a behaviour improvement (Mills et al., 2012).

Joffe (1999) argued that people discuss risk in a way that helps them to feel protected from a threat, rather than to reflect facts or cold calculations and simplifying and reducing the complexity of risk of bites to individual factors could achieve this aim. The focus on breed specifically can also be explained with reference to the theory of risk (Douglas & Wildavsky, 1983) which states that opinions regarding what constitutes risk depend on what a person or a social group considers as normal and valuable. Therefore, for instance, viewers who live or know pit bulls might be less likely to blame the breed as they value these dogs (Clarke et al., 2013), whereas viewers unfamiliar with the breed may emphasize risk posed by the breed itself. Overall viewers' perceptions share similarities with the risk factors for bites identified through epidemiological studies, i.e. dog's demographic characteristics, interactions preceding the bite, victim demographics, the relationship between the person and the dog, and features of the physical environment where the interactions are taking place (Overall & Love, 2001).

The understanding of risk and blame is usually dependent on the cultural and social context within which the judgement is made (Douglas & Wildavsky, 1983). This could not be fully explored here as it is not possible to contextualize the comments of YouTube™ users, which is a limitation of this study. However, as YouTube™ attracts viewers from around the world, the cultural diversity could play a part in differences in perceptions regarding e.g. breed determinism, normalcy of bites or the extent to which an individual can be held accountable for their behaviour. Moreover, given that reasons for dog bites may not always be clear, disagreements and contradictions regarding what constitutes risk, why bites occur and who should be blamed are to be expected. Previous research suggests that many bites may not always be easily prevented, for instance because the victim did not know what they were doing before the bite or what provoked it, or they did know it was a risk situation but continued anyway for various reasons (Westgarth and Watkins, 2015). In line with previous research, this study further suggests that some bites (by particular breeds and in specified contexts) may be difficult to prevent as they are perceived as normal (Westgarth & Watkins, 2015).

Here, dog bites *perceived* to be avoidable accidents and those thought to be responsible for them (e.g. parents or owners of dogs) were blamed. This may be detrimental to risk reduction as it may encourage stigmatization of bite victims and owners of dogs that bite, which can discourage them from seeking help or reporting bites. Multiplicity of views regarding why bites occur and who is responsible for maintaining safety make the development of a bite prevention campaign challenging and illustrates the need for any such campaign to be audience-specific and multi-level.

Following from the cultural-symbolic theory of risk, the pattern of blame attribution for dog bites reflects viewers understanding of the causal mechanisms behind bites (Douglas & Wildavsky, 1983). Here, these mechanisms included: victim's behaviour and owner's ability to control the dog which was perceived as conditional on owner's personality, knowledge of dog behaviour, dog handling skills and physical strength. Although risk identification was used to articulate blame attribution, risk and blame were also seen as separate. Dogs and children were identified as sources of risk, but with the exception of pit bulls, the blame for the bite was not attributed to them. The bite victims, their parents or dog owners were blamed instead. A previous study has noted a similar pattern in interpreting dog agency: the participants identify dogs as in control of their behaviour when initiating play but not when biting a person. An analogical bias in agency intention attribution was not observed for human subjects in the same context (Rasmussen and Rajecki, 1995).

Shaver (1985) argued that an actor has to be perceived as being responsible in order to be blamed. To do so, the actor has to be aware of the consequences of their actions, able to act differently in the given circumstances and the person judging needs to be sure that the actors' actions were not accidental (Shaver, 1985). It is clear from viewers' comments that they do not see dogs or children as responsible for a bite in this sense and do not blame either of them. Risk management was nonetheless seen largely as an individual responsibility. For example, viewers argued that through knowledge of dog behaviour, training and socialization, and appropriate control over one's own behaviour around dogs, individuals could prevent bites. This view is problematic as, public health prevention approaches that strive to change individual behaviours are far less successful than programmes that address underlying causes at a population level (Frieden, 2010). In the case of dog bites, structural interventions could include, for example: selective breeding of dogs with stable temperaments, policies regarding

muzzling and exercising dogs in public and fencing used to secure powerful breeds when in the yard, or programmes that facilitate structured socialization and training. Efforts should also be made to develop policies that operate at a population level and to shift the perception of bite prevention as a solely individual responsibility. Support systems should also be developed for owners of dogs that have bitten as well as dog bite victims and parents of children who have been bitten.

4.6 Strengths and limitations

It is difficult to assess how generally representative the population of YouTube™ users are. However, YouTube™ users represent a demographically diverse population in respect to gender, age, ethnicity and nationality (Ulges et al., 2013) which suggests that the range of perceptions under comments is fairly broad. Viewers can also respond to each other's comments and this dialogue can help to illustrate the lines of disagreement. Moreover, comments are likely to be typed up soon after viewing the video, and as users use alias and pseudonyms, they can be less self-moderated than comments offered in a face-to-face interview. Nevertheless, as it is impossible to further clarify users' comments, it is sometimes difficult to separate trolling comments from strong views, and a number of comments are ambiguous. Further, not all YouTube™ users watch videos of dog bites and even fewer leave comments. Moreover, only comments typed in English were analysed here and it is plausible that perceptions of non-native (English) speakers were different to those analysed. The sample used here may also be biased due to self-selection as not everyone uses YouTube™ and leaves comments under videos. Finally, although a large number of comments was analysed, this study only examined 10 videos. Future work should use qualitative approaches to further explore perception of dog bites and risk in human-dog interactions taking into account individual contexts.

4.7 Conclusion

This study identified the perceptions of risk in YouTube™ users' comments and patterns of blame attribution for dog bites. It was argued that the perception of risk in dog bites is a subjective, culturally-specific process and that the way in which blame for bites is assigned

reflects what an individual considers a to be a reason behind a bite. Viewers rarely blamed dogs for the bite as they did not see dogs as agents responsible for their behaviour. Dog owners and bite victims were blamed instead, as they were perceived as able to prevent a bite through control and provocation, respectively. Dog bites and bite prevention were seen as largely individual responsibility and risk of bites was often seen as simple and the interplay between multiple contributing factors was rarely acknowledged. Although YouTube™ videos need to be carefully interpreted, their analysis can help to identify attitudes and perceptions of risk around dogs that could aid bite prevention interventions and policies. Further consideration needs to be given to how individuals perceive responsibility and how they attribute blame for the bite incidents, as this could have a significant impact on the bite prevention messages. More recognition needs to be given to bites as complex events that cannot be prevented through simple changes in individual behaviour- instead a structural approach to bite prevention may be required. This approach is described in further detail in the subsequent Chapters.

5 Dog bite safety at work: an injury prevention perspective on reported occupational dog bites in the UK

This Chapter has been published in Safety Science, a peer reviewed journal focused on human-animal interactions (for the published version, please see Appendix 12).

5.1 Introduction

Being bitten by a dog is an occupational hazard in a range of professions. Bites not only have major physical and psychological implications for the employee, but can impact on employers due to the costs associated with employees being off sick after a bite or being unable to fulfil their contract to deliver people's mail and parcels (Langley, 2012). It is therefore important to better understand the range of affected occupations, the circumstances in which these bites occur, and any actions used to prevent them.

5.1.1 Dog bites in occupational contexts

As reviewed in Chapter 1, most dog bites are thought to occur in the context of casual, tactile interactions with dogs, like petting or stroking (Oxley et al., 2018, Owczarczak-Garstecka et al., 2018, Rezac et al., 2015, Reisner et al., 2007, Shuler et al., 2008). Some dog bites happen within the home environment when people enter a space that a dog may perceive as their territory (Oxley et al., 2018, Owczarczak-Garstecka et al., 2018). These types of interactions are a part of the routine work in a range of occupations, such as delivery or care services.

Dogs are the second most commonly implicated species of animals (after insects) in all animal-related non-fatal injuries within the American workforce (Drudi, 2000). Among those injured, the most affected occupations are: non-farm animal caretakers, truck drivers, veterinary technicians and meter readers (Drudi, 2000). Moreover, in two separate studies carried out in Brazil and Taiwan, approximately 70% of surveyed postal workers reported being bitten by a dog at some point during their career (Oliveira et al., 2013, Chen et al., 2000). An investigation into dog bites to postal workers in the UK reported that, on average, 6 postal

workers are bitten each day (Langley, 2012). Seventy per cent of these bites occur on private property, while posting a letter through a letter box, entering the front garden or handling a parcel to the dog owner (Langley, 2012). Furthermore, 48% of 2800 Australian veterinarians were bitten by a dog during the previous 12 months (Fritschi et al., 2006) and in the USA 63% of surveyed veterinarians have been bitten during the course of their career (Landercasper et al., 1988). In the UK, two out of three veterinarians were injured at work at some point and 78% of these injuries were animal bites, including dog bites (BVA, 2015). However, compared to working with other animals, veterinarians use fewer precautions when handling dogs (Lucas et al., 2009). Previous research into occupational risk of dog bites was largely focused on veterinarians and postal workers. In this Chapter a comprehensive overview of all occupational contexts in which people are bitten and an exploration of underlying circumstances in which these bites occur is presented to address this gap.

5.1.2 Bite prevention at work

The UK employers' responsibility for managing risk to employees, including the risk of dog bites, is articulated within the Health and Safety at Work Act 1974. The Act states that the employers have a duty to protect employees and the public from: "risks to health or safety arising out of or in connection with the activities of persons at work […] so far as reasonably practicable" (NA, 1974). An aspect of risk management is the reporting of "serious workplace accidents, occupational diseases and specified dangerous occurrences" to RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulation) database (HSE, 2018). The first aim of this Chapter was therefore to explore the demographics and circumstances of dog bites within occupational contexts in the UK using the RIDDOR database.

In practice, employers implement the Health and Safety Act 1974 (NA, 1974) through remedial actions i.e. organisational policies, which specify how and when risk can be controlled (Reason, 2000b). The classification of remedial actions depend on recognition and definition of a hazard. Hazards can be generally defined as "a set of circumstances which may cause harmful consequences", while risk is "the likelihood or its doing so" (British Medical Association, 1987, p. 13). Haddon (1970, 1973) proposed that the remedial actions can be understood in relation to the *stage* of operations when the risk is managed and identified 3 different time-points, which are referred to as pre-, during- and post-event counter-

measures. For instance, the impact of a potential hazard can be reduced in the first place by advising the employees to not interact with a dog or banning all dogs from a worksite (Haddon Jr, 1970, Haddon Jr, 1973). The impact of a hazard can be reduced during the event by issuing the person at risk with protective equipment (Haddon Jr, 1970, Haddon Jr, 1973). Post-event, a hazard can be altered by providing counselling to the bite victim (Haddon Jr, 1970, Haddon Jr, 1973). Haddon's classification of counter-measures was selected in this study as his approach is widespread in analysis of injury prevention, but has never been applied to dog bites (Haddon Jr, 1973, Runyan, 2003).

An additional level of understanding of the remedial actions can be gained by dividing them according to the type of control they offer, which here will be referred to as risk controls (Reason, 2000b). The risk controls explain *how* risk is managed. The administrative controls focus on provision of rules, procedures and policies which prescribe and prohibit certain practices. Individual controls focus on selection and recruitment of the right personnel and appropriate motivation, training/education per individual. Group controls include specification of norms and targets that all employees strive to meet, adequate supervision and other methods through which organisational values (including safety) are shared and adhered to (Reason, 2000b). Finally, technical controls use physical barriers and design features to guard from the hazard and make the unsafe behaviour difficult to perform (Reason, 2000b).

The risk controls and counter-measures can be applied at a single individual level (the employee, dog owner, bite victim etc.), the hazard (usually the dog), or the whole organisation. For instance, an individual control such as training can be applied at an organisation level (all employees are trained), or individual level (only one employee is trained). Equally, a counter-measure such as prohibition of contact with dogs could be applied at an individual level (one individual is banned from interacting with dogs or one dog) or organisation-wide level, when the ban applies to everyone and all dogs.

The focus of this Chapter was on understanding the risk controls and counter-measures listed in the remedial actions provided by the employers after accidents, using each of these analytical approaches as they provide different insights. The second aim was therefore to analyse the remedial actions listed in RIDDOR reports of dog bites to understand risk controls and counter-measures organisations use to prevent bites and alleviate their impact. The final

aim was to discuss literature on injury prevention within the occupational context and how it can be applied to dog bite prevention.

5.2 Materials and Methods

5.2.1 Data

The data presented here covers all injuries reported to RIDDOR between April 2011 and March 2018. This timeframe was selected because in April 2011 the reporting system changed and reports are now made online. From October 2013 there were legal changes to the RIDDOR reporting threshold. The main change was to the time off work (previously it was over 3 days incapacitation, since this date it is over 7 days). There were also some relatively smaller changes from previous definition of major injury to the current defined list of specified injury (HSE, 2018). Accidents need to be reported when either of these circumstances are true: a) they occur "out of or in connection with work" (this means that the database contains injuries to workers and members of the public, if they were injured in connection with work) and b) are classed as "reportable" (i.e. they result in a death, fracture other than to fingers or toes, amputation, an injury likely to have a permanent impact on someone's health and wellbeing or other specific type of injury); or c) resulted in more than 7 consecutive days off work (HSE, 2018). The variables recorded in the database are: date the incident occurred and report date; incident location (address); location on the worksite where the incident occurred; characteristics of the injury; age, gender and job title of the injured person; location of the injury on the body; the industry and work processes of the injured person; and a description of the incident, where the remedial actions taken by the organisation are often listed. For each variable the notifier can select the most appropriate description from a drop-down menu. For the description of the incident, job title and location on the premise, free text boxes are used.

5.2.2 Defining a hazard

Classification of the remedial actions as risk controls and counter-measures as defined by Haddon (1970, 1973) depends on the definition of a hazard. Fox (1999, p. 19) argues that hazards exist only within the interactive context: they become hazardous under certain

circumstances" but on their own, they do not have any inherent hazardous qualities. Here, hazard was defined as "a dog put in a situation likely to elicit aggressive behaviour", to reflect this context-specific understanding of hazards. Aggressive dog behaviour was defined as any behaviour, regardless of the underlying motivation, which "includes a threat or harmful action directed to another" (Horowitz and Neilson, 2007, p.10) and at extreme is a bite. This definition was dictated by the observation that for many dogs, the interaction of stranger approaching/entering a house is a reasonably high risk of eliciting some form of aggressive behaviour, as would be intimate handling of a dog in a veterinary context (Döring, Roscher, Scheipl, Küchenhoff, & Erhard, 2009; Hennessy, 2013). In contrast, a dog housed in a kennel environment is not generally at such risk of aggressive behaviour, unless put into a specific environmental or interactional context such as a handling or management procedure that increases arousal or fear.

5.2.3 Data handling and coding

The database entries between 2011 and March 2018 was searched for the word "dog". The incident descriptions were then read to exclude incidents which were not dog bites (e.g. being knocked over by a dog).

As RIDDOR relies on self-reporting, the occupational categories were cross-checked against free text job title and incident description to remove obvious errors (e.g. selecting "space transport" where job title states "Police Dog Handler" and a bite occurred during handling dogs, or selecting "other" where job title is stated as "Postal worker"). Summary data reflect these changes.

To derive categories describing the context of a bite and remedial actions taken after a bite, 30% per cent of the free text fields were sampled in vivo. This means that the categories were derived from the text to reflect the language used in the reports. Subsequently, the entire dataset was re-coded using these categories, updating them when required to include bite contexts/remedial actions not captured during the initial coding. The resultant codes made up the final coding framework (Table 5.1). Finally, a second coder, naïve to the study objectives, coded a randomly selected 15% of the dataset using the final coding framework. The inter-rater agreement was calculated using Cohen's Kappa and an acceptable reliability

threshold of at least 0.61 was set. The inter-rater reliability on all criteria was above the set threshold (between 0.7-0.95), indicating moderate to almost perfect agreement on all variable coding.

Table 5.1. *Categories describing the circumstances of a bite incident and the remedial actions taken by the organisations. Throughout the table, "unclear" refers to a description where insufficient details were provided. Variables used in Frequent Set Mining are marked with*.*

Variable	Levels/ Definition
Circumstance	0– unclear/lacking; 1- description provided
Space*	1- Private property (house and adjacent fenced area not used in a commercial/ occupational capacity) ; 2- Public space streets, avenues, alleys and any other areas not used in an occupational or commercial capacity; 3- Workplace (indoor or outdoor area of individuals' occupation); 4- Unclear
Action*	Action of an injured person preceding a bite. 1- Hugging (squeezing or embracing a dog with one or two arms); 2- Shouting at the dog; 3- Teasing (encouraging a dog on the lead/ chain to show an aggressive response); 4- Threatening a dog with a gesture (pretending to hit a dog with a bare hand or an object without making a contact); 5- Taking food/ treats away; 6- Falling onto a dog; 7- Lifting a dog; 8-Approaching a dog (walking towards a dog); 9- Feeding; 10- Grooming; 11- Aversive handling (person handles a dog in a way that may be painful or unpleasant e.g. jerking on the lead, nail clipping); 12- Playing or exercising a dog; 13- Entering/ exiting a room; 14- Training (e.g. asking a dog to sit, the category excludes training which involves playing or using toys, asking to fetch); 15-Splitting a fight; 16- Medical exam/ procedure; 17- Petting/ Stroking; 18- Handling (handling which is unlikely to cause pain or discomfort to a dog e.g. putting the harness or collar on); 19- Walking/ running past or nearby the dog without approaching; 20-Proximate to the dog (being next to the dog without interacting with a dog in any way, i.e. refraining from talking, looking,

	gesturing or touching a dog, whilst not walking or running). 21-Letterbox (delivering mail through the letterbox), 22- Entering/ exiting a private property; 23-unclear
Interacting with a dog before*	0- unclear; 1- the injured person interacted with the given dog before the bite
Off-lead*	0- the dog was on the lead 1- outside of private property, the dog was off the lead
Injured person knew the dog*	0- unclear/ did not know; 1- some evidence that the injured person knew the dog, e.g. use of name/ mention of the previous time the dog visited
Dog tied up*	0- dog was free to move; 1- dog was tied up or restricted by bars/ crate
Dog escaped*	0- unclear; 1- dog has escaped the property/ room/ owner before the incident, e.g. comments on owner response
Injured person was a dog professional*	0- the injured person did not work with dogs in a professional capacity; 1- the injured person worked with dogs professionally (e.g. a groomer, veterinarian, dog kennel worker)
Dog owner present during the bite*	0- unclear/ not present; 1- the dog owner was nearby when a bite occurred
Bitten by more than one dog*	0- bitten by one dog; 1- bitten by more than one dog
Remedial actions listed*	0- no remedial actions listed; 1- some remedial actions listed
Medical treatment-	0- no evidence that the victim sought medical; treatment 1- evidence that the victim sought medical treatment
Police notified/ involved	0-Were police notified/ involved 0-unclear/ the notifier states that the police was not notified or involved; 1- the notifier states that the police was notified or involved
Local authorities	Involvement of local authorities (the Local Council or Local Branch of RSPCA)

notified/ involved-	0- unclear/ no evidence that the local authorities were not involved or notified; 1- evidence that the notifier notified/local authorities were involved local authorities
Remedial actions articulated at the level of a dog	Types of consequences of the bite for the individual dog, e.g. euthanasia, dog required to undergo extra training, etc. See Appendix 2 for the full list of remedial actions
Remedial actions articulated at the level of an individual (victim/ customer/ dog owner/ employee)	Remedial actions that aim to affect one individual (dog owner/ client/ employee/ victim), e.g. additional training for the individual person, service to the individual customer terminated, information about the individual client updated on the database, incident investigated, incident reported to managers. See Appendix 2 for the full list of remedial actions.
Remedial actions articulated at the level of a whole organisation	Remedial actions which aim to change operations of the whole organisation, e.g. training for all employees, changes in the way data on customers are collected, policy changes in handling dogs. See Appendix 2 for the full list of remedial actions.

5.2.4 Remedial actions to the bite

To understand the use of methods of risk control and counter-measures, the frequency of their use at an individual person, implicated dog, and organisation-wide levels, was explored. When more than one way of classifying a counter-measure or a control existed, the measure was counted twice.

5.2.5 Risk controls

The remedial actions were first classified by the method of control they suggested, i.e.: administrative, individual, group, technical or a mixture of a number of controls. For operational definition of risk controls and counter-measures, please see Table 5.2.

Table 5.2. *Operational definitions of risk controls (Reason, 2000b) and counter-measures based on Haddon's classification (Haddon Jr, 1970; 1973; (Haddon Jr, 1973, Runyan, 2003).*

Risk controls- methods used to control risk	
	Definition
Administrative controls	any controls which intend to improve safety through a provision of rules, procedures and policies which prescribe and prohibit certain practices.
Individual controls	activities that intend to improve safety by hiring the right personnel, equipping them with relevant training/education and motivation.
Group controls	methods of improving safety through specification of norms and outputs that all employees strive to meet and other modes through which organisational values (including safety) are shared and adhered to
Technical controls	any methods of improving safety which rely on physical changes to the environment or equipment design to guard from the hazard and make the unsafe behaviour difficult to perform or impossible
Counter-measures- measures used to prevent and reduce the impact of an injury before, during and after an incident	
The pre-event counter-measures	1) Preventing creation of the hazard in the first place
The pre-event counter-measures	2) Reduction in the amount of hazard brought into being (e.g. limiting the top speed of a vehicle)

The pre-event counter-measures	3) Preventing the release of the hazard (e.g. installing locks to stop animals escaping from zoos)
The pre-event counter-measures	4) Modifying the rate at which the hazard is released or its spatial distribution (e.g. using fire retardants
The during-event counter-measures	5) Separating the hazard from the person by time and space (e.g. avoiding building children's playgrounds near busy roads);
The during-event counter-measures	6) Separating the hazard from the person by a physical barrier (e.g. using helmets);
The during-event counter-measures	7) Modifying relevant qualities of the hazard to make it less dangerous on impact (e.g. rounding edges of tables for children),
The during-event counter-measures	8) Making people or anything that is to be protected more resilient to the hazard (e.g. teaching children how to swim (Haddon Jr, 1973, Haddon Jr, 1970, Runyan, 2003)).
The post-event counter-measures	9) Countering the continuation or extension of the damage done by the hazard (e.g. smoke detectors);
The post-event counter-measures	10) Stabilising, repairing and rehabilitating the damage to the injured person (e.g. physiotherapy).

5.2.6 Counter-measures

The remedial actions were assigned into different counter-measures (Haddon Jr, 1973, Runyan, 2003) by deciding whether the remedial action was best described as being implemented before, during or after the bite. To ensure reliability, the codes were assigned independently by myself and one of the supervisory team members (Carri Westgarth). Coding agreement was later explored further and discussed until a consensus was reached. The operational definitions of pre-, during and post-event counter-measures that guided this classification process are provided in Table 5.2.

5.3 Data Analysis

Statistical analyses including cluster analysis were conducted in *R* (Statistical Package, 2009). Victim, context and action before the bite, risk controls and counter-measures were first summarised with descriptive statistics.

5.3.1 Frequent set mining

To explore patterns of association between victim characteristics, occupation and the circumstances of the bite (actions before the bite and other context variables), frequent set mining (FSM) was carried out. FSM is a cluster identification technique which helps to notice sets of items that often occur together using an algorithm (Goethals, 2005). *A priori*, the algorithm was set to identify the top 10 subsets of 3-4 items (See Table 5.1 for the variables which were used) based on *support* and *confidence* using the the *arules* package (Hahsler et al., 2018). *Support* is defined as frequency with which items appear together and *confidence* defines how often one item predicts the other two (Goethals, 2005). The top 10 sets of three reported here in Figure 5.3 were prepared using a network diagram prepared with graphic plotting software *Gephi* (Bastian et al., 2009), where variables are depicted as circles and their co-occurrence is symbolised with a connecting line. Remedial actions were not included as they were listed less frequently than other variables and they were too diverse to be included in frequent sets analysis in a meaningful way. All other variables were included.

5.4 Ethical considerations

Personal details of bite victims were removed before access by the researcher. The description of accidents was further anonymised before analysis by removing any identifiable characteristics of the reporting organisation, bite victim or a dog (i.e. names, exact locations, rare breeds, medical conditions etc.).

5.5 Findings

1812 incidents were identified. Three incidents occurred before the search time frame- one incident in 2009 and 2 in 2011, but had been reported during the search time frame. The

remaining incidents occurred and were reported between April 2012 and March 2018. All incidents were included in the analysis.

5.5.1 Occupation environment

Number of bites per occupational category where 10 or more incidents were recorded is summarised in Table 5.3. The most common occupational categories were: delivery services (i.e. primarily Royal Mail postal workers but also employees of other delivery companies); "other"; "public order safety activities and police" (police and army personnel excluding those who were clearly labelled as dog handlers); "veterinary activities" (i.e. vet surgeons, vet nurses). Members of the public were also among the top most common categories (employers are required to report these incidents if bites occur in connection with work). The free text "job title" for the category "other" was further explored. Of these, the most common occupations involved domiciliary care work (n=46), community health care workers (n=30) and property maintenance (n=23).

Table 5.3. *Number of dog bites by occupational categories as defined in the Standard Industrial Classification, the standard classification of industry developed by the Office for National Statistics.*

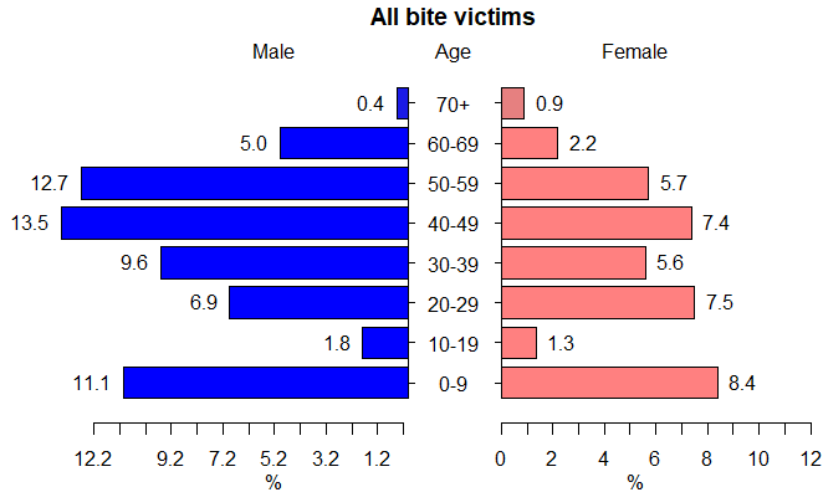
Occupational category	number of bites	% of all bites
Delivery	556	30.68
Other	224	12.36
Member of the public	190	10.49
Public order, safety activities, police	164	9.05
Dog kennels, shelters, and grooming	122	6.73
Veterinary activities	89	4.91
Police/army dog handlers	50	2.76
General public administration	35	1.93

Non-hazardous waste collection/ Other non-specialised	23	1.27
Flowers, plants, pet animals/food	21	1.16
Physical well-being activities	20	1.10
Electricity distribution/ Hospital activities	16	0.88
Elderly, disabled/ Residential, non-residential buildings	15	0.83
Plumbing, heat, air con installation	13	0.72
Warehousing and storage	12	0.66
Remaining categories combined	231	12.75
TOTAL	**1812**	**100**

The highest number of bites occurred in July (10.9%; n=178) and August (10.3%; n=167) and lowest number of bites were recorded in January (5.8%; n= 94). No trends between years were identified. The highest number of bites were reported to occur in London (n=84), Liverpool (n=36), Birmingham (n=33), Bristol (n=30), Glasgow (n=25), Leeds (n=23), Nottingham and Manchester (n=20 each).

5.5.2 Victim characteristics

Of 1812 reported bites, 1105 (61.0%) were to male victims and 707 (39.0%) to female victims. Age and gender of victims differed between occupations (Figure 5.1). The highest number of injured persons fit with age group 0-4, which reflects a choice of “0” when the notifier did not know the age of the victim; these cases were excluded from the age analysis in Figure 5.1 unless it was clear from the description that the victim was indeed a child. Ten point nine per cent (n= 198) of injuries were reported as occurring to a member of the public, including children.


All bite victims
Male
Age
Female
0.4
5.0
12.7
13.5
9.6
6.9
1.8
11.1
70+
60-69
50-59
40-49
30-39
20-29
10-19
0-9
0.9
2.2
5.7
7.4
5.6
7.5
1.3
8.4
12.2 9.2 7.2 5.2 3.2 1.2
%
0 2 4 6 8 10 12
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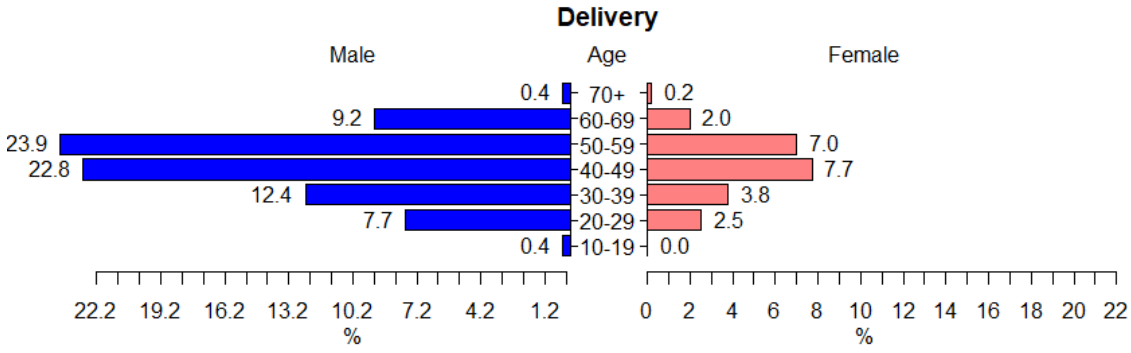
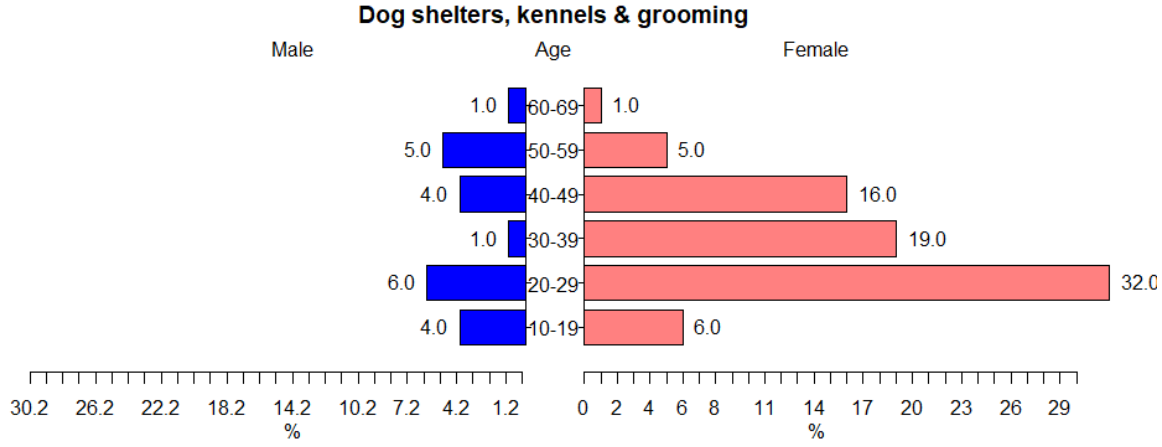

Delivery
Male
Age
Female
0.4
9.2
23.9
22.8
12.4
7.7
0.4
70+
60-69
50-59
40-49
30-39
20-29
10-19
0.2
2.0
7.0
7.7
3.8
2.5
0.0
22.2 19.2 16.2 13.2 10.2 7.2 4.2 1.2
%
0 2 4 6 8 10 12 14 16 18 20 22
%


Dog shelters, kennels & grooming
Male
Age
Female
1.0
5.0
4.0
1.0
6.0
4.0
60-69
50-59
40-49
30-39
20-29
10-19
1.0
5.0
16.0
19.0
32.0
6.0
30.2 26.2 22.2 18.2 14.2 10.2 7.2 4.2 1.2
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0 2 4 6 8 11 14 17 20 23 26 29
%

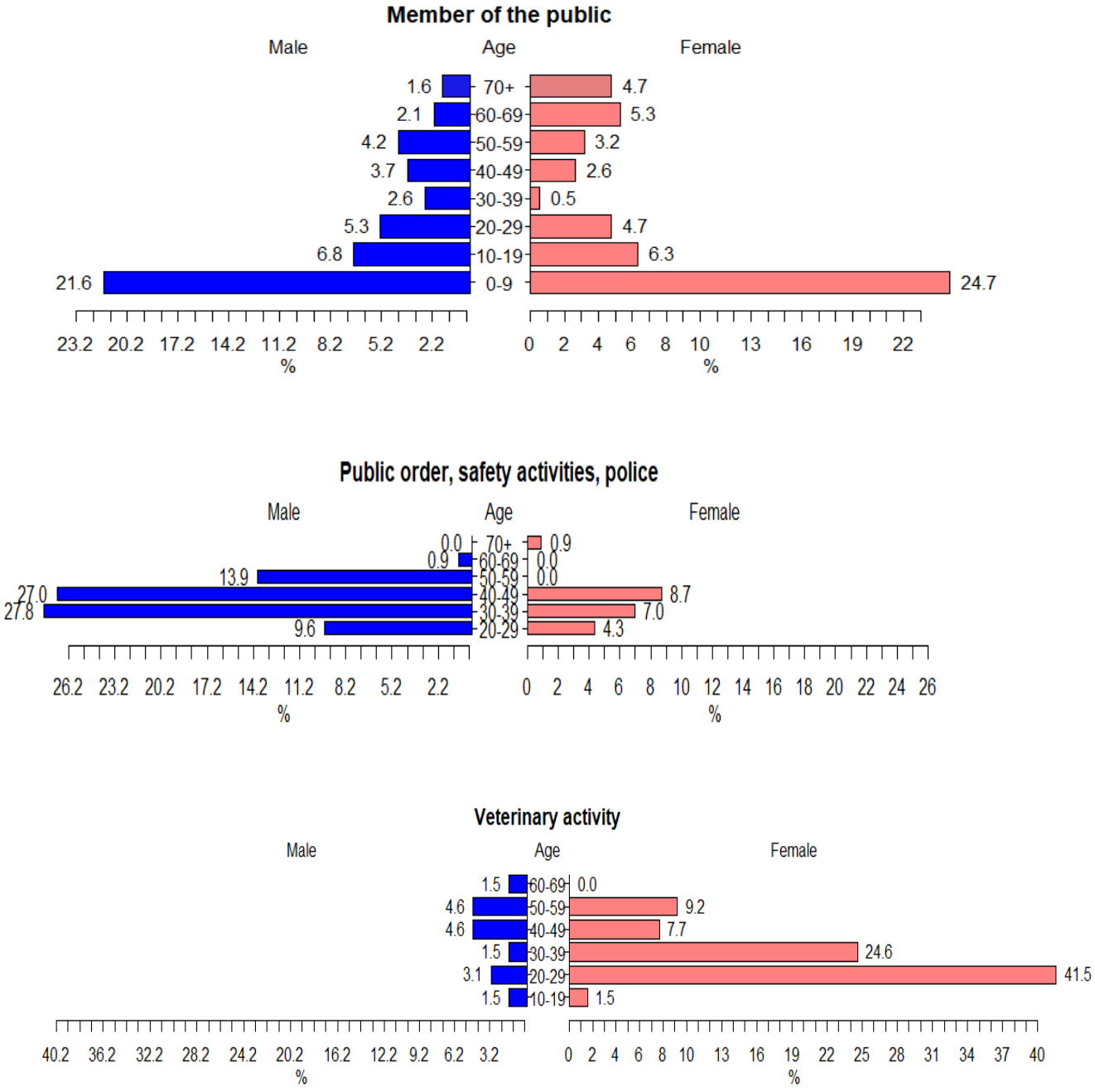


Figure 5.1. *Age and sex of dog bite victims bitten in or in relation to occupational context as reported to RIDDOR between 2011-2018 for the most commonly bitten occupations (delivery, veterinary activities, other, members of the public, dog kennel workers/ groomers and the public order, safety, police activity).*

5.5.3 Injury characteristics

Most bites were to upper and lower limbs (Figure 5.2). Most frequently reported types of injury were lacerations and open wounds (59.9%; n=1085), other known injuries (16.2%; n=293) and superficial injuries (9.3%, n=168). Work-related deaths due to dog bites were rare (n=7). Most (n=5) of the reported fatalities (n=7) appeared to be incorrectly recorded (i.e. it is clear from the statement that the injury was not fatal). Information regarding the remaining two deaths is in the public domain, hence it was possible to explore the underlying factors in more detail than a formal RIDDOR notification. This public information suggests that the fatalities occurred due to sustained injuries and possible pre-existing health problems. Therefore, in one case it is unclear if the death occurred as a direct result of a bite; another victim appears to have died of complications following a dog bite.

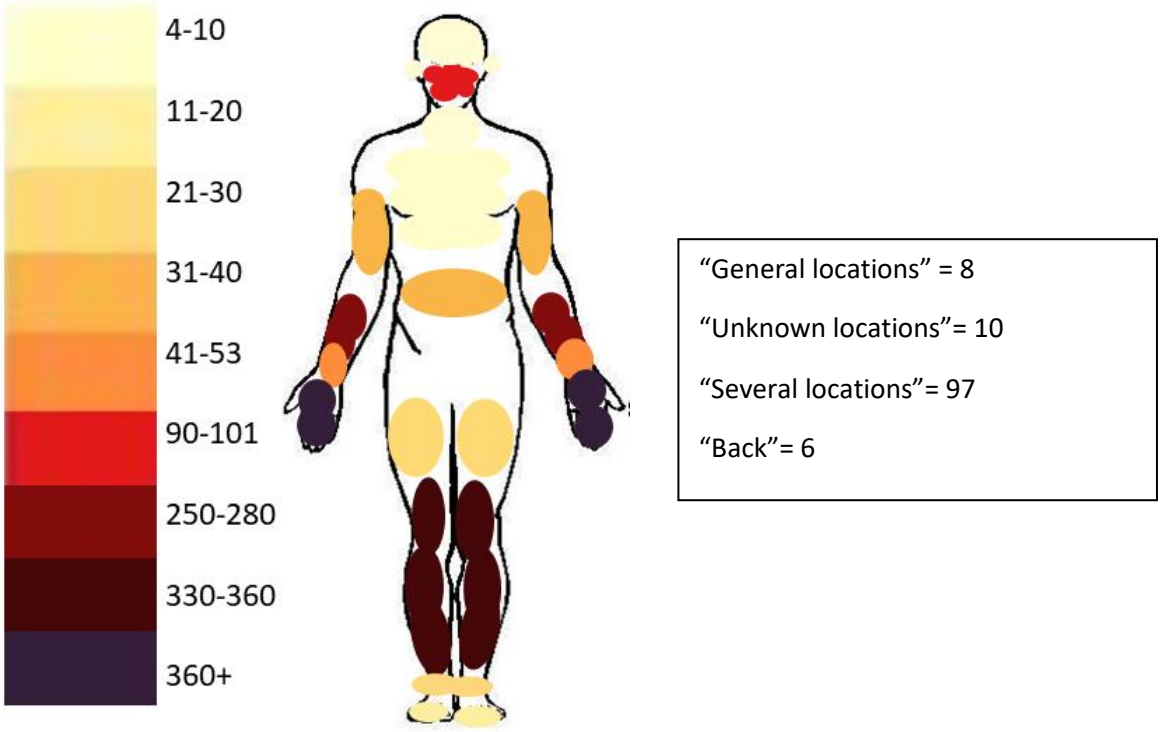


Figure 5.2. *Location of bite on the body reported through RIDDOR database between 2011-2018. The colour of a mark represents number of bites recorded. The description does not capture whether an injury occurred to the front or back of the limb.*

5.5.4 Context and circumstances of the bite

Just over half (56.3%) of bites occurred on private property (n=1020). Remaining bites occurred in a workplace (23.6%; n=428), public space (18.9%; n=342) or the location was unclear (1.2%; n=22).

The action of an injured person before the bite was unclear in 12.9% (n=284) of incidents. Other actions recorded before a bite were: entering and leaving a private property (19.5%; n=353); being proximate to the dog without any clear interactions (18.2%, n= 330); and putting a hand through a letterbox (15.7%; n=285). In 26.4% of bites a person interacted with a dog before a bite (n=478), but this figure was much higher in some contexts, for example during dog training. The bite victim knew the dog in 17.0% (n=307) of cases and their familiarity with a dog was unclear in 83% of cases (n=1505). The dog owner was present during 44.2% (n=801) of bites, in the remaining cases owner presence was unclear. Owner was present more often when a bite occurred in the context of entering a property, or when a person approached a dog. For bites which occurred outside, 95 (5.2%) dogs were described to be off lead and the restrain of the remaining dogs was unclear. Sixty-three (3.5%) dogs were tied up or in a cage when they bit, and dogs' movement was unclear during the remaining 96.5% of bites. A dog escaped confinement before 375 (20.7%) of bites, in other cases it was unclear. The victim was attacked by more than one dog in 51 (2.8%) incidents, in the remaining cases only one dog was listed. See Table 5.4 for summary of the contexts in which bites at work occur.

Table 5.4. *Characteristic of the contexts in which bites at work occur based on RIDDOR dataset 2011-2018 (n=1812).*

	Injured person interacted with a dog prior to the bite (%)	**Injured person was likely to have known the dog (%)**	**Dog owners were present during the bite**	**Remedial action listed (%)**	**Injured person was a dog professional (%)**	**TOTAL (n)**

Approaching a dog	20	13.33	66.67	33.33	13.33	15
Entering/ exiting a room	5.88	11.76	67.65	67.65	8.82	34
Entering/ leaving a private property	1.42	0.28	60.62	24.65	0.85	353
Falling onto a dog	33.33	44.44	66.67	55.56	22.22	9
Feeding	69.23	61.54	23.08	61.54	92.31	13
Grooming	100	58.82	5.88	29.41	100	17
Handling	97.96	59.18	21.43	52.04	77.55	98
Handling aversive	89.47	84.21	63.16	36.84	84.21	19
Hugging	100	0	100	0	0	1
Letterbox	0	0	2.11	21.40	0	285
Lifting	90	40	40	30	70	10
Medical exam or procedure	96.15	17.31	44.23	48.08	90.38	52
Petting/ stroking	77.22	25.32	58.23	51.90	16.46	79
Playing/ Exercising/ Dog excited	88.46	76.92	46.15	34.62	46.15	26
Proximity to a dog	26.97	20	68.79	40.61	24.85	330
Shouting at the dog	100	100	100	0	0	1
Splitting a dog fight	86	88	58	54	74	50

Taking food or treats away	85.71	57.14	42.86	42.86	57.14	7
Teasing	50	0	0	50	0	2
Threatening a dog	100	0	100	0	0	1
Training	93.55	70.97	83.87	33.33	90.32	31
Unclear	2.99	3.85	23.08	67.65	9.83	234
Walking/ running pass or nearby	3.45	3.45	53.79	24.65	6.21	145
TOTAL n (%)	478 (26.38%)	307 (17.0%)	801 (44.21%)	579 (31.87%)	393 (21.69%)	1812

5.5.5 Frequent set mining

The frequent set mining clarified two distinct occupational bite scenarios (Figure 5.3):

1. Bites to male victims, employed in a sector around service or assistance to the public (i.e. primarily, delivery of goods and mail, gas meter readers, domiciliary health care workers and care workers), bitten on private property, while entering or leaving it. Even though the owner was present in over 60% of cases the dog often escaped.

2. Bites to female victims who worked with dogs professionally, were familiar with the dog that bit them and interacted with them before the bite, within a workplace.

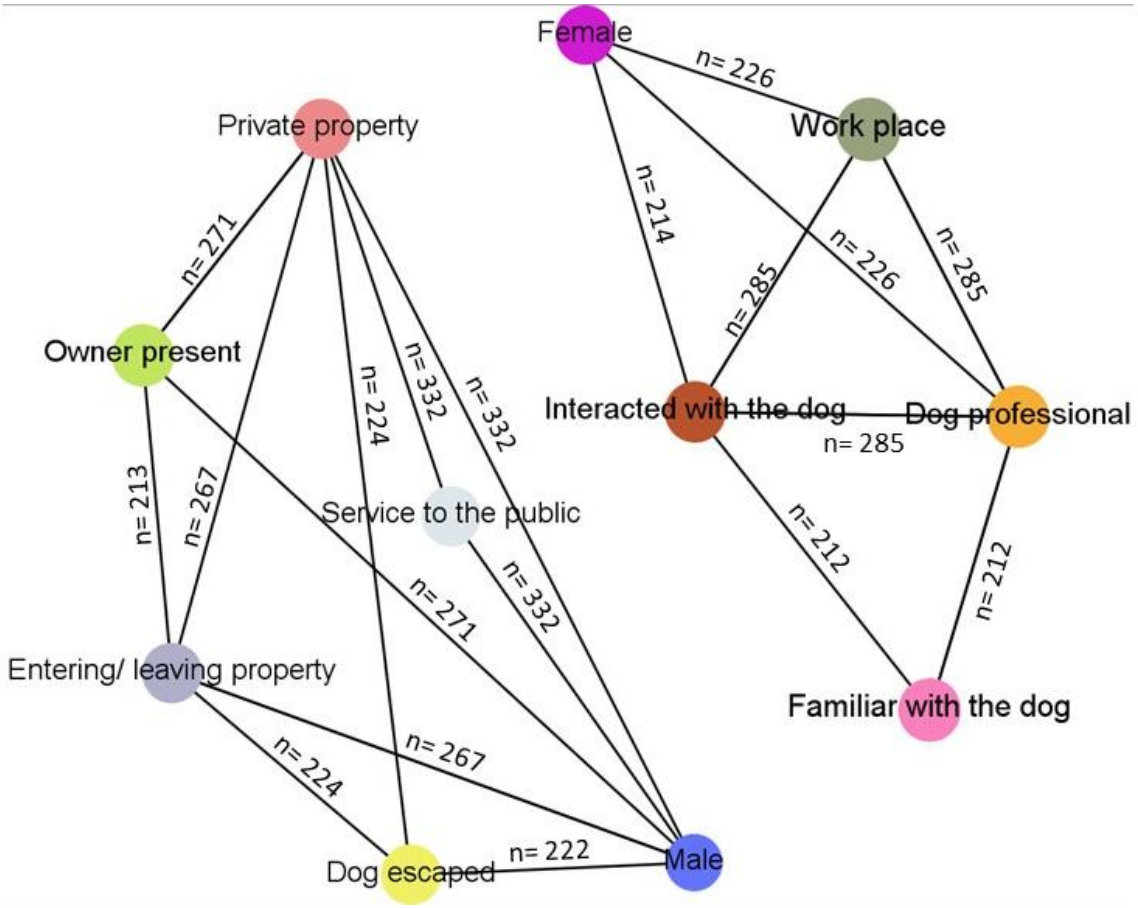


Figure 5.3. *Common bite scenarios. Graph shows the context, victim demographic and actions preceding the bite variables that were within the 10 most frequent sets of variables occurring together. Variables are depicted as circles and their co-occurrence is marked with a line. The number of times they co-occurred is added on the connecting line.*

5.5.6 Remedial actions

Out of 1812 reported dog bites, 30.3% (n=549) reported some kind of remedial action taken after the incident; in the remaining cases the remedial actions were not stated and it is unclear if they were taken. Seeking medical help was most common (n=445, 81.1% of all remedial actions). Police were involved in 105 incidents and local authorities in 21 (19.3% and 3.9% of all remedial actions respectively).

5.5.6.1 *Type of risk controls*

A total of 678 risk controls were identified and classified. Most risk controls were articulated at the level of the whole organisation (n=335, 49%), 18% of controls were implemented at an individual level (n=124) and 32% at a level of a dog only (n=219). For the list of all risk controls, see Appendix 2. Some risk controls fit into two categories (e.g. administrative and technical). Examples of administrative risk controls include: notes about the dog or a client being updated on a database to reflect presence of a dog or dog behaviour, an incident being investigated by the independent ombudsmen, sending a policy reminder regarding handling of dogs, or notes reminding to avoid entry if dog is present on the property. Examples of individual risk controls were: a review of task allocation; re-assessing dog-handler's skills; using a Pets as Therapy registered dog to help the bite-victim overcome fear of dogs. Group risk controls were used only once to discuss a bite incident with all staff. Finally, technical controls included: euthanasia of the dog; ensuring that dogs are muzzled when sedated; ensure dogs are separated from the staff by a muzzle, crate, doors, or other barrier when the service (e.g. care work, domiciliary care work, gas inspection) is provided in future; a change in equipment used for dog handling; and kennel re-design.

5.5.6.2 *Bite counter-measures*

A total of 1249 counter-measures were identified and classified including the medical counter-measures, 510 excluding these. Of all non-medical counter-measures, 80 (16%) were articulated at the level of an individual, 137 (27%) at a level of a dog and 293 (57%) at the level of a whole organisation.

The pre-event counter-measures used included preventing creation of the hazard (counter-measure 1) e.g. terminating the service to a client, euthanasia, rehoming, banning dogs from worksites. Reduction of the amount of hazard brought into being (counter-measure 2) was achieved by e.g. not admitting dogs with a known history of aggression. Preventing the release of the hazard (counter-measure 3) was seen in e.g. reminding staff to close the gate. Modification of a rate at which a hazard is released (counter-measure 4) was seen in e.g. reminding staff not to handle the dog too intensively or too often.

During the event counter-measures included separating a hazard from the person by time/space (counter-measure 5) by e.g. changing routes to work to avoid passing by a dog or banning employees from changing the time when they are providing a service (as dogs were secured only within specified time). Physical barriers (counter-measure 6) were used to prevent a hazard when e.g. the organisation requested installation of an external letterbox. The hazard was made less dangerous on impact (counter-measure 7) by e.g. muzzling a dog. This counter-measure was also classed as 6 as a muzzle can serve as a physical barrier from the bite. Staff were made more resilient (counter-measure 8) by e.g. changing communication systems to disseminate location of properties with known dogs, updating notes about an individual dog's behaviour, or giving additional training.

Finally, post-event counter-measures included medical care which aimed to counter the extent of the damage (counter-measure 9) through first aid at the scene, emergency care at the hospital, but also in installing alarms and CCTV cameras aimed to speed-up arrival of help. Stabilising, repairing and rehabilitating the damage to the injured person (counter-measure 10) was utilised by providing physiotherapy or counselling, and having a family liaison officer supporting the victim.

A number of remedial actions did not fit with the before- during- and after-event counter-measures defined by Haddon (1970, 1973). For examples, notifying the owner or manager of the incident, investigating an individual using an independent ombudsmen or prosecuting the dog owner did not prevent a creation of a hazard, lessened the impact of a bite whilst it was occurring or lead to a reduction of the damage or injury afterwards. Similarly, conducting internal health and safety reviews did not correspond to any existing counter-measures. See Table 5.5 for the prevalence of all counter-measures across the primary industries. For the list of all counter-measures in all industries see Appendix 2.

Table 5.5. *The prevalence of all counter-measures.*

Counter-measure	Veterinary care	Police/Army dog handlers	Dog shelters/kennels/ groomers	Delivery service	All occupations combined
Pre-event total (n)	**18**	**17**	**49**	**6**	**249**

1. Preventing creation of the hazard (%)	33.33	64.71	51.02	50.0	50.60
2. Reduction in the amount of hazard created (%)	27.78	1.55	19.6	16.67	23.29
3. Preventing the release of the hazard (%)	33.33	33.74	26.11	33.33	21.69
4. Modifying the rate at which the hazard is released/ its spatial distribution (%)	5.56	0	3.27	0	4.42
During-event total (n)	**37**	**30**	**31**	**18**	**224**
5. Separating the hazard from the person by time or space (%)	5.41	3.33	3.23	5.56	5.80
6. Separating the hazard from the person by a physical barrier (%)	8.11	10	29.03	33.33	17.86
7. Modifying relevant qualities of the hazard to make it less dangerous on impact (%)	21.62	0	6.45	5.56	3.57
8. Making people or anything that is to be protected more resilient to the hazard (%)	64.86	86.67	61.29	55.56	72.77
Post-event total -excluding medical counter-measures	**96** **1**	**74** **7**	**59** **6**	**17** **1**	**758** **19**
9. Countering the continuation or extension	0 84.38	0 58.11	83.33 67.80	0 58.82	10.53 86.15

of the damage done by the hazard -excluding medical counter-measures (%)					
10. Stabilising, repairing and rehabilitating the damage to the injured person -excluding medical counter-measures (%)	100 15.62	100 41.89	16.67 32.2	100 41.18	89.48 13.85
% of the total counter-measures that do not fit with this classification	1.99	3.31	1.44	2.44	1.44
TOTAL -excluding medical counter-measures (n)	**151** **56**	**121** **54**	**139** **86**	**41** **25**	**1249** **510**

LEGEND:

To illustrate difference in their use between occupations, counter-measures are shown for all occupations as well as the 4 most commonly bitten occupations for cases where remedial actions were stated (veterinary care, police/ army dog handlers, dog shelters/kennel workers/ groomers and delivery services).

5.6 Discussion

This study used the RIDDOR database to explore the occupational contexts, demographics and circumstances of dog bites and the remedial actions (controls and counter-measures) described in incident reports. The analysis crystallised two distinct occupational bite scenarios:

1. Bites to male victims, employed in a sector around service or assistance to the public (e.g. delivery services, gas meter reading/ home engineering, care work, domiciliary health care), bitten on private property, while entering or leaving it with the dog escaping and the owner present in over 60% of cases.

2. Bites to female victims, who work with dogs professionally (e.g. as veterinarians or in kennels), within a workplace, with the victim usually being familiar with a dog and interacting with them before the bite.

Majority of counter-measures were suggested post-event as they were medical counter-measures. Excluding medical counter-measures, a similar proportion of counter-measures were suggested pre- and during the event. Most of the counter-measures were articulated to affect the whole organisation. These findings suggest that the different bite scenarios require different prevention methods. Overall, most (74%) victims did not interact with a dog before the bite in any way. However, organisational responses to a bite, in the minority that any were reported, focused on trying to change individual person behaviour perceived as a risk.

5.6.1 Occupational bite scenarios

Nearly 80% of bites occurred when delivering mail or parcels, during care work, domiciliary health care provision or during veterinary or kennel work in dog shelters, boarding kennels or police kennels. These findings support previous research which shows that postal workers and veterinarians are at risk of dog bites (Langley, 2012, BVA, 2015) and extend it by highlighting additional occupations at risk, such as care workers, or kennel workers.

A dog may interpret approaching or entering the property as a threat to their territory– a bite is therefore an attempt to defend a valued resource (Mills et al., 2012, Blackshaw, 1991). Moreover, domiciliary healthcare workers and carers may face additional risk to postal workers as they more often interact with the dog owner inside a property. In this situation a dog may bite out of fear or to protect the owner (Blackshaw, 1991; Mills, Dube, & Zulch, 2012). Among the general public, bites in the territorial context (when encountering dog in a public space, whilst entering a room or property, walking with or past the dog or for unknown reasons) are relatively infrequent (Owczarczak-Garstecka et al., 2018, Oxley et al., 2018). In this respect, dog bites covered by the first bite scenario appear to be different to the majority

of bites within the general population. Moreover, in this study most (83%) bite victims were not familiar with the dog, which is different to previous research on which prevention efforts are based on which suggests that the victims are usually bitten by a dog that they know (Cornelissen and Hopster, 2010, De Keuster et al., 2006, Oxley et al., 2018, Reisner et al., 2011, Rezac et al., 2015, Schalamon et al., 2006). Instead, these observations agree with findings of Westgarth and colleagues (Westgarth et al., 2018) which has also shown that bite victims are often bitten by unfamiliar dogs. Dog bite prevention initiatives often focus on recognising signs that a dog is unhappy and may bite (Meints and de Keuster, 2009, Duperrex et al., 2009, Spiegel, 2000, Shepherd, 2009), but this data suggests that these are inappropriate for preventing bite scenario 1 bites, i.e. bites in a territorial context or when interacting with a client within the house. Instead measures are required to prevent any contact with mostly unfamiliar dogs, although education about behavioural signs in dogs could be helpful in case of the second scenario where the victims appeared to be familiar with and interacting with the dog.

Most studies report that the common interaction preceding bites involve casual, tactile contact, such as petting, lifting or playing with a dog (Owczarczak-Garstecka et al., 2018, Oxley et al., 2018, Reisner et al., 2011, Rezac et al., 2015, Shuler et al., 2008, Westgarth and Watkins, 2015). Although these interactions are a part of a normal human-dog repertoire, risk in the occupational context is greater because dogs visiting a veterinary surgery or kennels (boarding kennels, police kennels or dog shelters) are often distressed and may be in pain (Döring et al., 2009, Hennessy, 2013). The aversive state of being in a strange environment combined with a need for handling and contact during the medical examination could mean that dogs may be less likely to tolerate interactions. Professionals working with dogs familiar to them may also take more risks, as perception of risk towards familiar objects is biased (Slovic, 2000). Therefore, prevention for bite scenario 2 needs to focus on methods of interaction and handling with both familiar and unfamiliar dogs, for example staff training.

5.6.2 Victim demographics

Overall, men were over-represented as dog bite victims which supports other evidence of men being found to be bitten more often than women (Ó Súilleabháin and Doherty, 2015, Winter, 2015, Westgarth et al., 2018). The gender difference observed here could also reflect

that men are generally more likely to sustain a work-place injury (HSE, 2017). As a large proportion of bites at work are to postal workers (bite scenario 1), and the most numerous group of postal workers are men age 50-59 (Royal Mail Group, 2012), the gender bias could reflect the recruitment bias: only 16% of the Royal Mail Group's employees are women (The Prince's Responsible Business Network, 2019). Although overall men were proportionally more of the cases, in some age groups (20-24 and over 65) women were more common (bite scenario 2). It is possible that high number of female victims age 20-24 reflects the workforce of dog kennels and veterinary practices which is dominated by young women (Figure 5.1). Overall, the number of bite victims increases with each age bracket and peaks between 40-54. This could reflect the demographics of the UK workforce, with a third of workers being over 50 (Padilla, 2011). It is also thought that older workers are more likely to be victims of non-fatal injuries, a trend observed for the rates of fatal work incidents (HSE, 2017). Thus victim characteristics appear to reflect the workforce and general injury risk demographics rather than something particular to dog bite risk.

5.6.3 Context of a bite

Most bites were observed in June and July, as previously reported (Morzycki et al., 2018, Oxley et al., 2018). It is possible that warm weather means that dogs spend more time unsupervised in the garden. Summer holidays could also mean that children stay at home and may fail to control the dog when opening the doors, contributing to bites within the first bite scenario.

Cities where most bites were recorded were in Northern England, which also echoes rates of hospitalisation due to dog bites at a population level (Winter, 2015). Bite-related hospitalisations are correlated with the index of multiple deprivation (Winter, 2015). It could be that, as the North of England is more socio-economically disadvantaged, the underlying factors behind greater number of bites within the general population are also driving the numbers of dog bites within the occupational context (Winter, 2015). On average, only 9% of London's population own dogs compared with 27% of the North West population, 1% above the UK's average (PFMA, 2019). An alternative speculative explanation is therefore that northern areas, and lower deprived areas, simply own more dogs.

5.6.4 Injury characteristics

Bites within the occupational contexts were to hands, arms and legs, similar to what was previously reported (Morzycki et al., 2018, Oxley et al., 2018). As most bites resulted in at least a 7-day work absence, they are therefore likely to be more severe than bites recorded through other sampling methods. Nearly 60% of bites resulted in lacerations and open wounds and 16% in other known injuries, whereas in a convenience sample study, under 50% of bites resulted in any kind of puncture to the skin (Oxley et al., 2018).

5.6.5 Limitations of existing controls and counter-measures

Even if applied to the whole organisation, most counter-measures relied on changing individual behaviour. This focus on changing individual behaviour reflects a likely perception that most bites occur due to an "unsafe act" of a person, e.g. breaking rules, forgetfulness, poor attention or lack of motivation (Reason, 2000b). The controls and counter-measures aim therefore to manage risk by addressing human behaviour which is seen at the heart of the problem (Reason, 2000b). This is problematic as a systematic review of occupational accident prevention shows that trying to change individual attitudes (e.g. awareness-raising campaigns or policies) does not impact individual behaviour and therefore show virtually no effect on accident reduction (Lund and Aarø, 2004). Similarly, measures aimed at changing individual behaviour (e.g. through education or skills-based training) also rarely bring the desired effect (Lund and Aarø, 2004). Significant improvements in other industries where historically incidents were prevented primarily by addressing human behaviour, occurred only when the environment in which injuries occurred was addressed (Hemenway, 2009). Alternative approaches to bite prevention should therefore be taken.

Technical controls made up over a third of all controls and involved mainly removing or euthanizing dogs or providing a barrier between a dog and a person. These controls offer passive safety, i.e. safety which works even when the person is not aware of its existence and does not require behaviour change, and is thus most effective (Haddon Jr, 1980).

The pre-event counter-measures included preventing creation of a hazard by euthanizing a dog, terminating services to a client, or banning dogs from a worksite. Although these

counter-measures- just like the technical controls- are likely to be effective, they often just transfer the risk elsewhere. In addition, not delivering a service to a vulnerable person due to their dog, may impact their health. Moreover, as no organisation is in the business of ensuring safety alone (Reason, 2000b), prevention which relies on withdrawing a service may not be sustainable or practical.

Finally, a number of cases did not fit the existing classification. These measures can be seen as strategies that aim to restore justice- e.g. by reporting the owner or dog to the authorities or seeking prosecution or simply, following organisation's bureaucratic procedures. These approaches could be useful in challenging and changing social norms and improving victims' wellbeing however their impact on actual dog bite risk is likely minimal.

5.6.6 Implications for policy and practice

5.6.6.1 *System-focused model of accident prevention*

Dog bites in occupational contexts share a number of commonalities with other occupational incidents. Principles used in other industrial contexts could therefore be applied. An alternative to a model which focuses on individual behaviour is one that suggests that incidents occur when multiple layers of failures align (Reason, 1990). In this system-focused approach, people are assumed to make mistakes and the mistakes are understood as a result of distant factors – the environment, equipment, management, clarity of procedures, or harmful social norms (Reason, 1990). Therefore, the system-focused approach advocates a multi-layered strategy to incident prevention, which guards against human-error occurring, and identifies, counters and reduces the impact of an incident when it does occur through a range of tactics (Reason, 1990). Below, suggestion on how this could be applied to dog bites in the occupational context is presented.

5.6.7 Developing consensus on a definition of a hazard

Effective accident prevention relies on clear and shared definitions of a hazard, an incident, and a near miss, in order to facilitate reporting, investigation and learning (Hurst, Young, Donald, Gibson, & Muyselaar, 1996). Organisations need to establish a shared understanding of these terms in the context of their activity. In the methods, a suggested definition of a

hazard was: “a dog put in a situation likely to elicit aggressive behaviour”; this can be used by organisations to define the hazard in their context. For a delivery worker or property visitor this means that any and every dog is a potential hazard. For a veterinary or kennel worker, certain contexts which turn a dog into a potential hazard need to be accounted for.

5.6.8 Safe design- using technical controls

Structural modifications of the environment, hazards (dogs) and equipment used for work, i.e. technical controls, appear to be the most effective tactics that prevent occupational incidents (Lund and Aarø, 2004). Some counter-measures and controls already focused on this aspect of prevention in a productive way, e.g. by suggesting re-designing kennels. This tactic needs to be developed further, beyond euthanizing the dog or restricting the service. Good examples of positive changes include changing routes to work, or providing personal protective equipment (which still relies on individual behaviour change as the individual has to use the equipment).

5.6.8.1 *Accident reporting and investigation*

A number of organisations reported that “the accident was investigated”. Investigation and review of policies were mentioned frequently but rarely in detail, which could hinder learning and early warning from near-misses. Thorough incident investigation, where the person carrying out the investigation is separate from the person deciding on potential sanctions, is crucial to reduce the focus on individual behaviour and blaming, and to understand real causes (Reason, 2000a). It is also important not to assume the same rationalization for the bite (e.g. assuming that all bites through a letterbox occur for the same reasons) as this can preclude learning (Cannon and Edmondson, 2005). Although the RIDDOR database does not capture near misses, improvement in near-miss reporting and monitoring discussed as a counter-measure that was going to be applied was not seen. High quality incident and near-miss reporting systems are important for preventing injury (Barach and Small, 2000) and need to be structured around confidentiality, ease, accessibility and a swift provision of timely, achievable and specific feedback (Reason, 2000).

5.6.8.2 *Addressing social norms*

Overall, interventions which employ a number of measures- aiming to address attitudes, behaviours and physical/ structural conditions- appear to be most effective, potentially because they are most likely to address norms and cultural factors behind accident occurrence (Lund and Aarø, 2004). A number of bites during delivery occurred when the owner was present or the dog escaped. This suggests a need for a public campaign to address the potential perception that it is safe to enter a property with a dog when the owner is present. Given the number of incidents where a dog escaped, securing all dogs prior to opening doors also needs to be normalised and an element of dog owner responsibility to do this.

A number of bites to kennel workers and veterinary professionals occurred when they were interacting with a familiar dog. Previously, qualitative studies of dog bites indicated that bite victims often think that a bite would not happen to them (Westgarth and Watkins, 2015). It is therefore necessary to normalise the idea that any dog can bite and to still use a level of caution around all dogs. The social norms around safety at work could be addressed through group controls, for instance, through briefings and debriefings before a potentially risky intervention (e.g. assessment of a dog with known behaviour problems within a shelter) or after an incident or near-miss has occurred. This approach could help to develop a shared understanding of why an incident occurred and how it could be prevented in the future (Cannon and Edmondson, 2005). On-the-job peer-observations and feedback could also help to identify potential near-misses that are not recognised (Cannon and Edmondson, 2005).

5.6.8.3 *During and post-event counter-measures*

During-event and post-event counter-measures other than medical treatment were lacking in the assessed cases. The damage done by dog bites could be limited by ensuring staff are working in pairs during high-risk situations (e.g. in kennels, vet practices), and are equipped with panic alarms and communication devices (walkie-talkies, mobile phones) which could help to alert others to attend the incident. Non-medical ways of stabilising and rehabilitating the damage to the injured person could include phased re-introduction to work (in terms of range of duties, working hours, geographical area covered or challenge presented by the

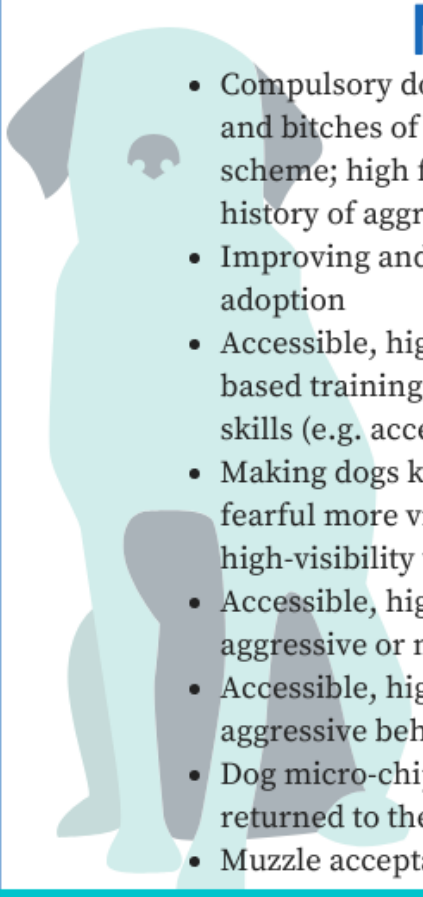
dogs), additional support (e.g. in the form of dedicated peer support) in a period after the incident, and an opportunity to formally discuss the incident with colleagues.

5.6.8.4 *Context- specific prevention*

Differences between occupations in use of controls and counter-measures were observed. These differences could reflect different safety cultures in these contexts (Reason, 2000b), or simply practicalities of work. Context-specific approaches to prevention are therefore needed. For example, in the scenario one of delivery/home visits, prevention mechanisms should emphasise: notifying the employees of dogs' presence; physical or time barriers when a person needs to enter a property; communication systems which can be used to ask the clients to keep a dog secured; and addressing social norms and other social factors which lead to keeping dogs in front gardens or not securing them when opening doors. Further skill training in dog-body language or dog handling would be unlikely to prevent many bites in this scenario as the victim is often not aware of the dog before being bitten. Handling dogs is unavoidable in bite scenario two of kennel/veterinary work, thus understanding of dog behaviour and body language could be useful, as well as focus on low stress dog handling (Yin, 2009). Additional measures could be: minimising frequency of handling when it is not necessary, by for instance introducing a cool-off period after a dog is first admitted; restricting the number of staff who interacts with a dog; restricting the number of high risk situations (like vet visits or dog-dog testing if dog is known to be reactive to other dogs); and improving environmental design). Figure 5.4 offers a summary of suggestions on how safe design could be used for bite prevention.

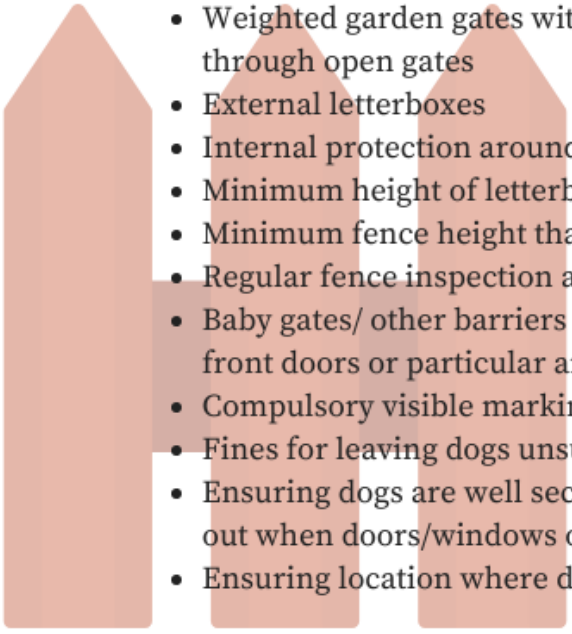
SAFE DESIGN FOR BITE PREVENTION

MODIFYING DOGS



- Compulsory dog breeding regulations: published temperament tests for sires and bitches of all dogs whatever breed; breeder registration and accreditation scheme; high fines for unregistered breeding or breeding from dogs with a history of aggressive behaviour; no 3rd party sales of puppies
- Improving and popularising behaviour-tests for assessing dog's suitability for adoption
- Accessible, high-quality puppy socialisation and training classes using reward-based training and focused on improving dog's resilience to stress and life skills (e.g. accepting veterinary examination, interactions with strangers)
- Making dogs known to be reactive or aggressive to strangers or dogs that are fearful more visible when in kennels or in public e.g. by fitting them with high-visibility vests or yellow ribbons
- Accessible, high-quality behaviour counselling for dogs known to show aggressive or nervous behaviour
- Accessible, high-quality veterinary care to prevent and treat medical causes of aggressive behaviour (e.g. pain) and using low-stress handling techniques
- Dog micro-chipping and collar identification tag to ensure that the dog is returned to the owner quickly if lost
- Muzzle acceptance training and common use

MODIFYING THE HOME ENVIRONMENT



- Weighted garden gates with dog-proof latches preventing dogs from escaping through open gates
- External letterboxes
- Internal protection around the letterbox slot
- Minimum height of letterbox placement in doors above dog level
- Minimum fence height that matches dogs height and jumping ability
- Regular fence inspection and repair
- Baby gates/ other barriers within the house that prevent dog's access to the front doors or particular areas of the house
- Compulsory visible marking of properties with dogs
- Fines for leaving dogs unsupervised in gardens
- Ensuring dogs are well secured when travelling in cars so they cannot jump out when doors/windows open
- Ensuring location where dog is fed and sleeps cannot be disturbed

MODIFYING WORK ENVIRONMENT

- External drop off places for parcels/ mail
- Increased home-to-home rehoming (dogs avoid being in a shelter)
- Increased home vet visits to avoid bringing dogs to a vet clinic (whilst protecting vets from potential territorial aggression)
- Kennel design using walkways/physical barriers to prevent dogs from arousal on sight of another dog when being walked
- Environmental enrichment and kennel design which reduces dogs stress when in kennels
- Safety divides in kennels to allow separating dogs from people, such as double door systems
- One way systems for walking dogs through pathways
- Mirrors to show what is around corners
- Provision of panic alarms and CCTV
- Making dogs known to be reactive or aggressive to strangers or dogs more visible using colour coding on kennels
- Warning system to notify of potential dog presence when approaching clients property

MODIFYING WORK EQUIPMENT

- Issuing people who use letterboxes with posting pegs
- Provision of muzzles and common accepted use
- Quality standards for the production of leads, collars, harnesses and muzzles to prevent accidental slip off
- Using dog toys/ training aids which are sufficiently big to prevent dog biting person's hand during play or training
- Work clothing that protects exposed limbs and which does not encourage ragging (close-fit)
- Using gauntlets/ hard boots/ long sleeves when handling dogs that are known to show aggressive behaviour
- Availability of shields, bite sticks and long-arms in kennels to aide rapid separation of a fight or dog attack
- Anti-slip shoes which help to stay erect if attacked by a dog
- Provision of satchels/trolleys to be used in defence during an attack
- Automatic shut kennel doors

Figure 5.4. *List of technical controls of the work and home environment, equipment and dogs which could be implemented as pre-, during- or post- bite counter-measures to create a safe design. List was developed with the most often bitten occupations in mind.*

5.6.9 Strength and limitations

The main strength of this study is that it is based on a large dataset of dog bites in a previously unreported context, work-related injuries. It is also the first example of applying well-known injury prevention theories and successful approaches to dog bites. However, as RIDDOR relies on self- reporting, the reliability of information included cannot be verified. Rates of incident reporting between industries differ, with smaller companies and people who are self-employed underreporting incidents (Lindberg et al., 2010). The person reporting the incident is not always the bite victim, which may reduce the detail and accuracy of information shared. Moreover, only a proportion of cases could be used in the analysis of controls and counter-measures as this level of detail was not included in all reports. As the reports are offered to the regulatory body, the range of counter-measures and controls suggested may be biased to be broader than the counter-measures/controls that are actually implemented. The opposite is also plausible; not listing a counter-measure or a control does not mean it was not put in place. However, this data provides the first analysis of counter-measures used to prevent occupational dog bites. The accidents reported under RIDDOR need to result in over 7 day work absence which means that they are likely to be biased towards the most severe bites.

5.7 Conclusion

This study shows that dog bites at work share many commonalities with other work-related injuries. Bites at work follow two common patterns which require different prevention approaches. Most of the counter-measures and risk controls discussed by the organisation rely on modifying individual behaviour, which limits effectiveness of prevention. Future bite prevention should instead focus on modifying the home and work environments, dogs encountered, and equipment used at work. Campaigns should also address social norms around dog ownership and safety. Future research should explore how organisations can effectively record bite near-misses and learn from them.

6 “If you don’t see the dog, what can you do?” A qualitative investigation of negotiating risk of dog bites using procedures

6.1 Introduction

In Chapter 5 it was highlighted that organisations often rely on procedures for bite prevention. However, these procedures reflect “work as imagined”, i.e. how management perceive work practices and are therefore what is reflected in guidelines compiled in formal documents. This may be different to “work as actually done”- the everyday risk-work involved in identifying and managing risk, which could combine the formal protocols and personal, experience-based routines (Antonsen et al., 2008, Veltkamp and Brown, 2017). Formal protocols are developed on the basis of understanding risk as an objective phenomenon that estimates the severity and likelihood of an event and then maps directly onto the underlying hazard, i.e. anything that can cause harm (Fox, 1999). In practice, the hazard caused by a dog and the risk around it may not be perceived in this way. Individual, subjective experiences of dogs could shape what one identifies as a hazard. Consequently, understanding of risk will also differ between individuals.

Further, unlike technical contexts where procedures are used to manage risk not encountered in daily life (e.g. nuclear industry), dogs are common and encounters with dogs frequent and often unexpected. Most people have some experience with dogs outside of the workplace, which may also contribute to their interactions with dogs as well as their take on workplace procedures. Therefore, management of dog bites can offer insights into interactions between different understandings of risk and different modes of risk management more generally. This tension has practical implications; whilst discrepancy between the formal rules and actual practice is normal, too large a gap can pose a considerable challenge to the management of employee safety (Lautman and Gallimore, 1987). The interplay between “work as imagined” and “work as actually done” is therefore particularly interesting in the context of managing risk a round dogs, and understanding the difference can therefore contribute to improving dog bite prevention.

6.1.1 Managing risk through procedures

Work safety procedures are assumed to help to manage risk by minimising the variation of human behaviour and thus reducing the chance of human error (Reason, 1997). It has been argued that the proliferation of procedures to manage risks, reflects a broader change in work-place environments (Dekker, 2003) and changes in perceptions of risk (Lupton, 1999). The drive to improve work efficiency has resulted in an individual worker being more likely to work on a specific aspect of a task rather than see it through from beginning to an end (Dekker, 2003). These changes require work to be prescriptive, standardised and therefore inscribed in procedures (Robson et al., 2007). This manner of standardising work often means that work outputs and processes become quantifiable, which enables and promotes understanding risk as an objective, measurable phenomena (Lupton, 1999).

Safety protocols can lead to safer practices. For example, reduction of incidents in aviation and medicine has been attributed to an introduction of checklists (Lautman and Gallimore, 1987). However, provision of procedures does not guarantee an improvement in incident prevention (Dekker, 2003). Procedures can also shift the responsibility for safety management from the organisation to frontline staff, as it is easy to identify when their behaviour was not compliant with the procedure (regardless of whether it actually contributed to an incident, or was consistent with the demands of the task in hand). Therefore, a by-product of safety procedures can be “blame-the-worker” attitudes and result in a change in power relations between the workers and employer (Power, 2004). In addition to managing the risk of injury, organisational safety procedures can maintain existing organisational culture, knowledge, values and norms (Gherardi, 2004). For instance, organisations may use accident prevention protocols to manage their reputations and to shape their public image (Power, 2004).

Most people have some experience with dogs outside of the workplace, which may also contribute to their interactions with dogs as well as their take on workplace procedures as they may approach dogs in a routine manner. Routines, defined as a course of actions followed regularly and developed organically through practice, can also contribute to safety and may overlap with procedures. In addition, routines have also been described as a source of comfort, because they help to dispel any uncertainty regarding the best way of managing risk in daily lives (Giddens, 1984).

6.1.2 Chapter aims

Given the lack of understanding of what people do to stay safe around dogs, the aim of this chapter is to explore how risk of dog bites is perceived and how safety around dogs is negotiated. This chapter aims to explore the role of work procedures specifically, as it emerged as an important theme in the analysis presented in Chapter 5. The second aim was to discuss different ways of understanding risk and safety around dogs which emerge when procedures are enacted in practice. The final aim was to provide recommendations for dog bite prevention.

6.2 Findings

6.2.1 Participants characteristics

A total of 55 participants took part in this study (of whom 36% identified as men and 63% as women). Sixteen participants (8 men and 8 women) were interviewed and 39 (12 men and 27 women) were joined during participant-observations across all fieldwork sites. The average age of participants was 39 and the age range was 19-55. Participants' experiences ranged from not being bitten to being bitten 3 times, and from bites that did not puncture skin to digit amputations.

6.2.2 Thematic analysis

Themes reflected different sets of procedures and routines related to dog bite prevention: surveillance of dogs, communicating risk, taking actions to manage perceived risk, reporting bites and near-misses, investigating bites and learning and teaching safety (Figure 6.1). Procedural sub-themes are represented here as distinct, in practice however they were often interconnected and overlapping, for example surveillance of dogs led to changing a person's behaviour as they were reacting to what they saw.

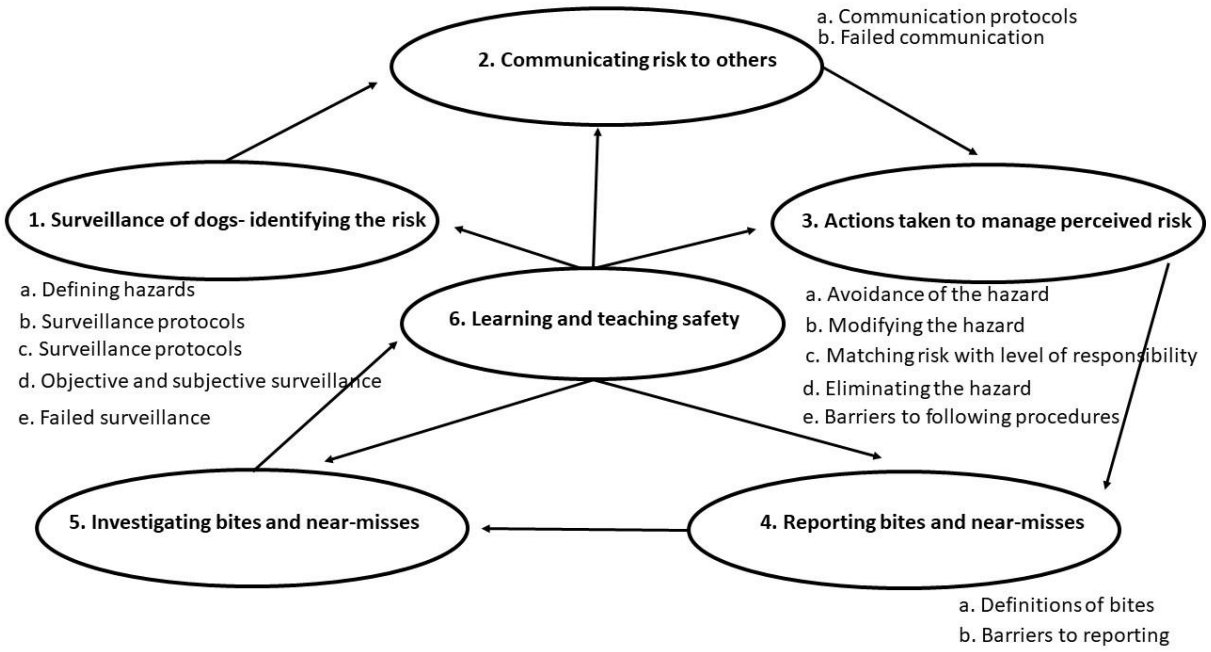


Figure 6.1. *Schematic representation of the identified themes relating to dog bite prevention within work contexts.* Each theme (1-6) corresponds to consecutive and co-dependent step of bite prevention. Sub-theme (a-e) are listed next to the theme. Learning and teaching safety can affect each of the previous steps and is also influenced by all of them.

6.2.2.1 *Surveillance of dogs– identifying hazards*

A crucial part of procedures for surveillance in delivery companies and dog shelters was identifying what should be noticed, i.e. what is a hazard. Although hazards were not always explicitly defined in dog shelters, surveillance was centred on noticing dog body language. All participants from dog shelters watched for the same behaviors- e.g. changes in posture, position of a tail, ears, lip licking, raising paws or head turning. At the same time, interpreting dogs' body language also relied on subjective judgement:

"He'll lift his paw, he lies on his back, and it's just him being him (…) I know that I can still touch him when he's doing that (…) but if anybody else went in that kennel, they'd probably be like, "Shit, I'm not going anywhere near this dog," because he's showing every sign that he doesn't want you to go and attach the lead". Annie, Dog Shelter.

In dog shelters, formal surveillance protocols were based on learning about a dog's past behaviours from owners through a relinquishment forms and structured interview,

observations of specific dog behaviours throughout their stay in the shelter and formal assessments. For instance, one of the formal assessments aimed to provide a measurable understanding of hazard posed by the dog was based on a score attributed to several behaviour observations. The list of behaviours to identify were based on understanding some dog behaviours as objectively hazardous. The subjective aspect of the assessment was minimised by relying on specifically trained staff and corroborating scores between assessors. At the same time, the protocol was headed with a question: *"Always think to yourself when filling in this assessment would you consider living with this dog?* This introduced the need to rely on subjective judgement to enact the hazard identification protocol.

Efficacy of surveillance protocols was limited when staff had to interact with dogs before they were formally assessed, when dog behaviour changed during their stay in a shelter and when behaviours were difficult to observe or interpret:

"The worse dogs are those that give no affection – you know, a dog that's not being funny with you, but also not being nice. "What do you think!? Just give me something!"" Alice, Dog Shelter.

While in shelters, surveillance procedures were focused on observing dog behaviour, in delivery companies they were based on scanning the environment for presence of dogs. Even when dogs were not seen, it was suggested that delivery workers should double check by rattling the gates to make dog appear in order to avoid them:

"When you're [delivering mail or parcels] (…) you risk assess in your mind every property that you go to. You're listening out for any slight noise. You're looking for any indication that there's a dog. (…)" Ben, Delivery Company.

One of the delivery companies explicitly defined "dog hazards" as:

"Any animal that poses a threat while attempting to deliver or collect mail [or parcels]. Including:

Any dog or animal which: has attacked previously, (…) is restrained to avoid contact with delivery staff due to the likelihood (…) attack, (…) is roaming in its garden/ territory that presents a risk of attack (…) that shows aggression to other dogs or human, (…) that the

delivery staff are uncomfortable with, (…) dogs behind letter boxes snapping at letters during delivery (…)". Delivery Company.

Being able to list all hazards suggests that hazards were objective. However, hazard identification also required recognising when a dog made one *feel* uncomfortable. Like dog shelters, enacting the safety protocols in the delivery company required drawing on a subjective judgement, which meant that *any* encountered dog could be perceived as a hazard.

Within delivery companies, surveillance procedures failed when there were no signs of a dog living on the property, when it did not appear when gates were rattled, or when they escaped through open doors.

6.2.2.2 *Communicating risk to others*

6.2.2.2.1 Communication protocols – making risk visible

Shelters and delivery companies aimed to make the risk of dogs visible to other workers.

In shelters, risk was communicated by displaying information about the dog in multiple places (e.g. on the kennel doors and whiteboards in communal areas) and visually highlighting important information by colour-coding dogs as green, amber or red to reflect the level of identified risk. Discussing dogs' needs and behaviour with the prospective new owners was also a way of communicating risk. Dog behaviour flagged during assessment was often formally discussed during scheduled staff meetings. The formal communication was further reinforced with informal conversations about dogs. These conversations dominated lunch breaks and carried on after work on social media and in other contexts. The success of risk communication in dog shelters therefore relied on formal procedures but also informal social networks.

Risk at one of the delivery companies was made risk visible by logging recording dogs presence in designated books kept where staff prepared segregated items for daily delivery. Items for properties known to have dogs were also marked visually, to remind the delivery person about the animal when the property was approached. This was seen as particularly important as a person delivering an item may not always be familiar with the area of delivery and could be different to the person who prepared items for the delivery, increasing the

reliance on written notes to communicate the location of hazards to others. However, due to lack of time, this procedure was not always followed. In addition, one of the Delivery Companies was trialling a standardisation system which translated the observations to a quantitative expression of risk:

"(…) I produced 2 drop down boxes, scoring 1 to 10. One box measured the perceived severity of an individual dog attack and the second drop down box measured the likelihood of an attack from the same animal. (…). Then I produced a matrix to lead the compiler to an action for that dog." Adam, Delivery Company.

This communication procedure was designed to represent dog risk empirically, adhering to the common definition of risk as severity multiplied by likelihood (Royal Society, 1992). However, the severity of a bite was assessed *before* it occurred and depended on the subjective assessment of a dog by the delivery worker. Enactment of the communication protocol therefore required drawing on the personal experience and subjective judgement of risk.

6.2.2.2.2 Communication breakdown

Lack of communication regarding presence or behaviour of dogs was seen as a primary reason for bites at work:

"*I think that there was a miscommunication of how aggressive this dog was. And the nurse went in to go and get the dog out of the kennel (…) that's when the dog attacked the nurse.*" Amy, vet nurse Dog Shelter.

In one of the Delivery Companies, employees were responsible for highlighting hazards to the managers, who then evaluated hazards and decided on how it can be controlled. Managers then updated records regarding hazards. Managers reported however that it was sometimes difficult to get this information from frontline personnel. Frontline staff complained that occasionally they wished to report dog hazards, but were pressed for time or ignored, making them reluctant to make a report in the future. This demonstrates the role that informal social relations with colleagues play in shaping how the procedures were practiced.

6.2.2.3 *Actions taken to manage perceived risk*

Once a risk was known, it was perceived that it can be managed by changing human or dog behaviour.

6.2.2.3.1 Avoidance of the hazard

During participants observations it was noted that one of the delivery companies had in recent years adopted a protocol which stated that employees should avoid all dogs (e.g. by crossing the street if a dog was visible, asking customers to restrain their dogs before opening the doors) and refrain from making the delivery if this was not possible. This was a departure from a previous protocol where only specific dogs identified as dangerous were avoided. The other delivery company advised workers to avoid dogs when they believed the dog was dangerous.

6.2.2.3.2 Modifying the hazard

In dog shelters dogs themselves could not be avoided. Attempts to modify their behaviour and thus avoid creating a hazardous situation (aggressive dog), were made instead. During participants observations it was observed that in some shelters, unsafe behaviours were often altered through dog training, e.g. dogs were taught to step back when a person was entering a kennel. In all shelters dog risk was also modified by changing behaviours such as taking different routes when walking around the worksite to avoid agitating dogs; using treats to distract dogs; or allowing dogs time to accustom to the veterinary procedure:

"If they don't like the vets, we'll build up things slowly. (…) We would just go into the [vet] room, feed the dog, take him back out, (…) and then eventually, you would maybe touch his ears (…). Maybe then slowly introduce a stethoscope (…), and then probably introduce the vet or the vet nurses." Nick, Dog Shelter.

6.2.2.3.3 Matching risk with level of responsibility

In both delivery companies and shelters, responsibility could be passed to someone higher in authority when a dog hazard could not be altered. In one of the delivery companies, if a non-

delivery occurred, the manager contacted the customer (paradoxically by delivering a letter to the household) explaining that the dog risk had prevented the original delivery. In shelters, dogs that were assessed as more challenging were transferred to experienced staff. Managers also encouraged staff to seek the help of more experienced colleagues, demonstrating that organisational culture and leadership style can influence safe behaviour, and the role of social networks in negotiating safety.

6.2.2.3.4 Eliminating the hazard

The final action taken in response to perceived risk was euthanasia. Decisions regarding euthanasia were never made lightly and followed different procedures which combined protocols, assessments of dog's health and welfare, and judgement of risk the dog posed to themselves, employees and the public:

"it's never, "Oh, it bit one person." (…) It means this dog is really not rehomeable. It's aggressive. Its welfare is not good. It's a big picture. (…) [A number of members of staff involved in training, day-to-day care and veterinary treatment] have to agree. It's a massive process." Isabel, Dog Shelter.

Some shelters emphasised that dogs are only euthanised when all other options (training, medications) were explored and a dog's welfare is compromised. One shelter expressed an additional concerns about the negative impact on the shelter's reputation, should a person who rehomed a dog be injured by a dog:

"You've got to think of the centre as well, because everything is now recorded. Every bite. Every bark. (…) And if that dog went out and caused trouble, there is a paper trail right back to us. And in this day and age with people suing each other, it's just not worth the risk. You could lose your centre, your reputation (…)" Matt, Dog Shelter.

6.2.2.3.5 Barriers to following procedures

Staff in one of the delivery companies often relied on their own methods for managing risk around dogs, such as carrying treats, despite this being not within the organisations' procedures:

"We had a guy (…) who'd been bitten by a dog, but continued to interact with dogs. (…). I had to say to him, "Look, you can't do it." I said, "(…) You're at risk and you put others at risk. You're putting yourself in a situation where the [organisation] will frown on you, if you get bitten. You're paid to deliver mail [or parcels] (…) not (…) to go stroke a dog."" Frank, Delivery Company.

As the above quote shows, a preference for a routine "*that worked for you*", (Harriett, Delivery Company), was often given as a reason for not adhering to organisational protocols. However, not following protocols meant that one could be found responsible for having an accident and risk losing their job as it was a violation of a procedure.

Another barrier to adhering to procedures was that management of dog safety had become more bureaucratic:

"*If you go on (…) the [organisations portal], there are hundreds, if not thousands, of safety documents. Sometimes, the frontline staff, the managers, the reps don't know where to go with it."* Frank, Delivery Company.

Further, adjusting behaviour did not always bring the desired results. Participants argued it was impossible to adhere to the safety procedures and complete a delivery round within the timeframe stipulated in other protocols. Another unintended consequence of following procedures and avoiding dogs was that this could upset the customers. During fieldwork, Ed described how his refusal to deliver mail after a customer failed to secure the dog led to the customer's complaint and investigation into Ed's conduct. He was disappointed with his employer for siding with the customer and believed that the investigation undermined the value of procedures in negotiating safety.

Staff in one of the shelters pointed out that safety procedures sometimes conflicted with other aspects of safety. For example, they were required to wear ear protectors and could not hear colleagues shouting for help. Faulty equipment was also a problem as they could not ask for help via the radio because it was outside of the range of the receiver. However, overall, in dog shelters the experienced risks were more congruent with procedural risks and the risks identified by frontline staff were similar to those identified in protocols, compared to the delivery companies where this was less the case.

6.2.2.4 *Reporting bites and near-misses*

6.2.2.4.1 Definitions of bites

Reporting of bites depended on how they were defined. One of the shelters did not have a written definition. Other shelters had written definitions of bites, where bite severity was expressed on a scale (where the lowest number referred to a near-miss which triggers provision of additional training for a dog and the highest number denoted multiple puncture wounds). However, in the course of fieldwork, participants did not refer to this definition, possibly because it was less well known to staff. Alternatively, in practice, staff may have assessed severity of bites with reference to own experiences. For instance, during focus groups discussions, most members of staff agreed that a bite occurs when a dog punctures skin. However, when interpreting what happened *to them,* they also included the context and the perceived motivation behind the incident to define a bite:

"*When Moon got me, we did an accident instead of a bite report, because he didn't really mean it, he just was like, "Ah," because obviously he was in quite a lot of pain"* Amy, Dog Shelter.

In shelters, even when near-miss reporting was possible, the perception was that bites "*count against dogs*" and could lead to a dog being euthanized or struggling to be rehomed. For instance, I observed Izzy assessing a large, young dog. Before the assessment started, Izzy explained that it is just a formality, as the dog is unlikely to be accepted to her kennels as she could tell he was too nervous and out of consideration for his welfare and training needs, another organisation will take care of him Izzy described the owner as *"harsh"* and emphasised feeling *"sorry for the dog"*. During the assessment the dog lunged and bit her arm. She recorded this in the dog's file as *"uncomfortable when being handled"*. Later Izzy explained that the dog did not puncture skin (a thick jacket helped) and admitted that she did not want him to have a bite "on the record". During observations in shelters, near-misses were usually noted as dog "*mouthing hard*", "*playing*", "*nipping*" etc., further allowing for subjective definitions of such reports.

In addition to broken skin, participants in the delivery companies used a dog's breed to define the severity of a bite. For instance, in one of the delivery companies, a participant expressed

his frustration when reporting a serious bite by a dog of small breed, as his colleagues did not consider it a bite.

6.2.2.4.2 Barriers to reporting

Similar to Izzy's example above where she did not report the bite for fear of it '*counting against the dog*', delivery workers discussed cases where a relationship with a customer or dog stopped them from reporting bites. In addition, when deciding whether to make a report, a number of participants assessed the potential risk to others:

"I didn't [report the bite]. (…) the only walk it gets in a day is at 5 o'clock in the morning, so I know it's not a danger to the public. So I thought, "I don't really want to be responsible for a dog getting put to sleep."" Georgia, Delivery Company.

In one of the delivery companies, a time-pressed environment and cost of incident investigations were also described as contributing to underreporting. However, the most salient factor influencing bite reporting in both shelters and delivery companies was fear of being blamed. Within shelters, a bite was often seen as reflecting lack of dog-handling skills, knowledge regarding dogs' body language or common sense:

"I think (…) people think "Oh, he wouldn't do that to me," or, "They must've done something wrong." (…) there can be quite a blame game", Eli, Dog Shelter.

Similarly, in the delivery company frontline workers believed the main risk they faced was not that of dog bites, but the risk that emerged when they were blamed for a bite when seen not following procedures.

6.2.2.5 *Investigating bites and near-misses*

In dog shelters, investigation consisted of a conversation with the victim and witnesses and reviewing notes about the dog to establish what happened. Typically, a further discussion with all staff followed to ensure all were aware of any measures that may have been missed. Although the investigations aimed to learn how to prevent future incidents, one participant expressed her scepticism:

"they just tell you about reporting things, but nothing ever comes out of it; no lessons are learnt, or procedures changed", Rita, Dog Shelter.

Fear of unsettling work relationships was also quoted as a reason for not investigating bites:

"*We didn't go in great depths of whose fault was it, and who should have done this, and who should have done that. I think it's just something that you don't really talk about, because everyone sort of works well with each other*." Clair, veterinary nurse bitten at work.

In one of the Delivery Companies, the investigation process was more prescriptive. The investigation form listed all possible procedures and safety-related behaviours; it was therefore difficult not to select some boxes and conclude that an incident was blame-free. For example, one report, assigned the blame for the bite to the employer, as the "relevant equipment and supervision were not provided". However, this bite would not be prevented through provision of relevant equipment, as the dog escaped from a property and the victim was not aware of the dog. Some participants suggested that these forms were used to assign blame for the accident, usually (but not in the case above) onto frontline staff:

"It's supposed to be a root-cause analysis investigation. In my opinion, it's usually Inspector Clouseau who does it. (…). It's trying to attach a blame to somebody, rather than it just being a freak accident" Cameron, Delivery Company.

6.2.2.6 *Learning and teaching safety*

The final set of procedures for managing risk around dogs was impartment of skills and knowledge that were believed to improve their safety. In all organisations training included learning organisation-specific surveillance techniques. In one of the Delivery Companies, participants were also taught the organisational procedures for reporting of incidents.

In addition, in some shelters, training included different dog training techniques. Here, participants attended regular training sessions, took part in induction (also delivered in delivery companies) and a mentoring programme that mixed practical and theoretical training.

Participants also learnt informally, from colleagues, family or friends:

"You can't learn everything from training sessions. (…) And I suppose like, when you're in the [kennels], you do get to speak with people, and you do get to learn what they've been doing (…)" Freya, Dog Shelter.

All participants also described learning from prior incidents involving themselves or colleagues:

"*I think definitely after you have been bitten or had an incident, it does make you a lot more mindful and it really helps you to see how a dog can progress to a certain thing."* Amy, Dog Shelter.

Participants described some practical barriers to learning about safety. In delivery companies, part-time staff were not always present during training; dog-safety was not always covered during inductions and peer coaching as procedures stated; and managers were not always committed or effective at delivering training. In one of the shelters, formal training was minimal due to lack of resources.

Some participants felt that learning sessions were 'tick-box exercises' designed to show that the training took place so the organisation could not be seen as responsible for the incident due to negligence, rather than equipping staff with skills:

"It's a rushed message. (…) Then there's a queue because, when you've had the message, you've got to sign to say you've had it. (…) So they sign the sheet before they've had the message." Cameron, Delivery Company.

Learning and teaching safety was focused on identifying hazards, communicating risk and changing behaviour. It also depended on reporting and investigating bites, as what was being taught should reflect knowledge gained from previous incidents. Barriers to learning and teaching therefore undermine effectiveness of all safety procedures.

6.3 Discussion

In this chapter, we highlighted that procedures are important in shaping perceptions of, and managing risk around, dogs. Although details of the procedures differed due to specificity of the context of person-dog interactions, procedures took 6 forms: surveillance of dogs, making risk visible to others, taking actions to manage or avoid the perceived risk, reporting,

investigating bites and near-misses and learning and teaching safety. Our findings raise some important points for discussion below.

6.3.1 Preventing work incidents vs. preventing dog bites

The procedures for identifying and managing risk recognised here share similarities with those listed in oil, aviation, and nuclear industries, where hazard surveillance, effective risk communication, risk avoidance, appropriate record keeping and systems ensuring investigation and organisational learning are routine (Dien et al., 2004). In addition, actions taken to manage perceived risk can be mapped onto the UK's Health and Safety Risk Control Hierarchy (RCH) (HSE, 2011). RCH presents risk management as steps with decreasing efficacy from risk elimination (most effective), engineering controls, administrative controls to use of personal protective equipment (HSE, 2011). Accident prevention research also highlights that accidents at work occur due to a combination of: human errors; technical failures; and broader organisational factors, which encapsulate the safety culture within the organisation (Reason, 2000b). Our study resonates with this understanding as our participants described a combination of these factors contributing to a bite incident. Surveillance was the fundamental platform on which managing dog-related risk was built. Parents of children with autism also describe "vigilant parenting"- strikingly similar to the surveillance practices described by people working with dogs- as they are always ready to act, a strategy they use for identifying and managing challenging behaviours in their children (Woodgate et al., 2008, p. 1079).

This study is different to other research and discussion into dog bite prevention, which is often based on the premise that an individual's behaviour alone leads to dog bites and therefore advocates development of education and skills programmes (in particular for children) around hazard recognition and behaviour around dogs (Shen et al., 2017). In fact, dog behaviour and the likelihood of a bite is shaped by multiple factors, including socialisation, genetics, context of interactions as well as behaviour of a person (Newman et al., 2017b) and individual behaviour *alone* is rarely a sole cause of incidents (DeCamp and Herskovitz, 2015). When procedures focus primarily on changing individual behaviour, systemic changes that could improve safety are potentially ignored.

6.3.2 Differences in perceptions of risk

The legal responsibility for risk management encourages tangible, measurable and thus auditable definitions of risk (Turner and Gray, 2009). However, in practice, the risk of dog bites, is not experienced as an empirical phenomenon. We have highlighted how hazards and risks linked with dogs were constructed, e.g. through procedures for identifying and quantifying hazards (Fox, 1999). They were also subjective: risk was identified with reference to procedures, but also individual situated knowledge, prior experiences and different contexts. For example, in dog shelters the presence of a dog was rarely seen as a hazard, but in the delivery company, it was. Perceptions of risk were also dependent on the relationship with dogs; an affinity for the dog meant participants in the shelter did not sometimes interpret a behaviour as risk. In addition, enactment of protocols and procedures required drawing on subjective judgements and assessment of risk and social relations, which also contributed to a discrepancy between "work as imagined" and "work as actually done".

Procedures and protocols were focused on risk related to the remit of work, while in practice, individuals working with or around dogs identified other, sometimes competing risks. For instance, in the delivery companies, frontline staff identified avoiding dog bites, conflicts with colleagues and conflicts with customers as a risk, but the managers were also concerned about potential reputational risk created by suspension of a delivery. Ensuring efficiency of the delivery process was sometimes seen by the frontline staff as contributing to risk they experienced. Dog shelter staff were concerned with bite risk to themselves but also the risk to dogs when a dog's welfare was compromised. Workers also identified the risk to the potential adopters, and associated risk to the organisation's reputation. The complexity of how participants identified with different risks impacted on adherence to procedures.

6.3.3 Is safety just a lack of risk?

Although safety tends to be defined as absence of risk and rarely by its own inherent qualities (Reason, 2000b), here risk and safety have been constructed in different ways. For instance, the occurrence of dog bites did not always make frontline staff *feel* unsafe, whereas feeling blamed and fear of the incident investigation process did. Feeling safe depends on trust, often built on perception of competency and faith (Zinn, 2008) in having the support of colleagues, managers and the organization. In this study, surveillance of risk, effective communication

and feeling supported by colleagues contributed to the staff experience of safety. Conversely, lack of trust towards the organization and fear of being blamed for incidents meant that staff perceived the risk at work as high, even when organisations had procedures for risk management.

Organisation-wide risk management protocols alone did not always make people *feel* safe. However, routines (which were often reflect in formal procedures) that "worked for you" were seen as helpful. In this way procedures, like routines, can offer a sense of security by limiting the overwhelming number of options and a need to continuously scrutinise individual behaviour for safety by providing fixed rules instead (Giddens, 1984).

Participants suggested that sometimes safety procedures were used for reasons other than avoiding risk. For example, investigations of bites and the presence of safety training in one delivery company was described as a way of demonstrating that safety is maintained and a mechanism for blaming workers. It has previously been shown that organisational procedures indeed have many functions, including maintaining an organisation's reputation (Power, 2004), and helping to develop organisational memory and identity (Gherardi, 2004). Procedures for identifying risks also created a perceived opportunity for managing those "at risk" (Lupton, 1999a) and were often interpreted as enabling employers to be able to call out workers for acting outside of organisations' policy, regulate their behaviour and shift the responsibility for safety onto them.

6.4 Implications and recommendations

Research has previously identified numerous reasons for lack of compliance with procedures, which resonate with our findings regarding safety when working around dogs. This includes an excessive number of procedures; procedures that impose heavy restrictions on workers actions; perception that compliance takes time and effort; and differences in perceptions of risk between those involved in the development of protocols and frontline staff (Antonsen et al., 2008). Streamlining the number of procedures and developing procedures and definitions of dog bites with frontline staff could improve compliance.

Despite formal protocols for risk assessment, participants often drew on subjective understandings of the hazards and risks they face, which were not and could not always

realistically be covered by organisations' procedures. Safety may therefore be improved by not penalising staff for deviating from the prescribed procedures, especially if adherence to the procedures was not going to result in a safe outcome.

Fear of being blamed had a negative impact on reporting incidents and near-misses. This is dangerous as studies from construction and aviation industries indicate that fewer near-miss reports lead to higher chances of a serious incident (Dekker, 2014). Addressing victim-blaming could help to improve reporting of bites so that actions can be taken to prevent them later.

6.5 Conclusion

Procedures involving making risk visible and communicating risks are common strategies used to prevent dog bites and are the primary focus in workplace risk management regarding dogs. Discussions around dog bite prevention at work are, in fact, discussions about the role of an employer as a protector of health *vis a vis* an employee's responsibility to protect their own health and the question of what is the extent to which an employer should protect the individual. Organisations aim to prevent bites through surveillance mechanisms, making risk visible and expecting and assisting change in worker behaviours. Some of these procedures are defined as objective processes. In practice, negotiating safety includes following procedures but also subjective, context-specific judgement of risk. The adherence with procedures depends on overlap and shared understanding of risk between organisations and individuals. Systems of bite prevention generate their own risks and the ultimate practices of staff encompass management of risks as they see, including these identified by the organisation.

Our findings suggest that simply making and following protocols may have limited effect on managing dog bites. To avoid dog bites, management and employees need to pay attention to the contextual factors of the risks in their workplace, promoting safe and blame-free working climates.

7 “They always say to you, “Oh, it’s friendly,” but then they're biting your calves”: the role of relationships, trust and a sense of responsibility in maintaining safety around dogs

7.1 Introduction

In this Chapter, I explore a number of interrelated ways through which trust was used as a strategy for knowing and managing risk (Zinn, 2008) in the context encounters with dogs.

The concept of trust and how it is used as a safety mechanism in the context of human-dog interactions will be discussed first. Later, I will discuss the findings and explore how judgements of trustworthiness and responsibility are intertwined.

7.1.1 Role of trust in risk assessment

It is not always possible to assess and respond to risk using procedures and guidelines. Events may unfold rapidly, and adequate procedures may not be available. Zinn (2008) straddles between psychological and cultural theories of risk and suggests that in daily life risk is assessed and managed by using “in-between” strategies: trust, intuition and emotions (Zinn, 2008). These strategies aid the assessment and management of risk. They are based on evidence in the form of experience, sensory responses and an assessment of the situational context (Zinn, 2008). They are therefore combinations of personal knowledge, including the impact of the risk on emotions and empirical assessments (Zinn 2008). In this way, the in-between strategies differ from decisions based on hope, faith or belief, which are typically non-rational, passive and made against existing evidence, or when the evidence is insufficient or lacking. The in-between, as well as non-rational strategies may help individuals to cope with risk and encourage action (Zinn, 2008, Giddens, 1999). Trust is built on prior knowledge as well as an element of hope and trust is defined here as “a bet on the future contingent [on] actions of others” (Sztompka, 1999, p. 25) in uncertain conditions. Moreover, much like following routines and procedures, trust is also motivated by psychological comfort: making

decisions and taking actions within the environment of low predictability and controllability is described as taxing and detrimental to health and wellbeing (Miller, 1979).

The decision to place trust is made based on reputation (i.e. the record of past behaviour); performance (observations of current behaviour); and appearance (physical characteristics of the trustor, i.e. the actor that is being trusted, Sztompka, 1999). The trustor's reputation is judged more easily and with greater certainty when they have been known over a long period of time (Sztompka, 1999). Reputation can also be assessed via proxy, i.e. by assessing trustworthiness of sources of information about the trustor (Sztomka, 1999). For example, a person could trust a dog because they trust their owners. Or they may use performance of the dog on the basis of reading dog's body language to trust it before deciding whether to interact with it, as has been described in Chapter 6. Some physical characteristics of dogs may also be used to place trust in them based on appearance. Perception that pit bulls are more dangerous than other breeds as discussed in Chapter 4 is a good example of this. Trust in breeds may also be shaped by the reputation of breeds or personal experiences with them. For instance, judging Staffordshire bullterriers as dangerous may be influenced by lack of personal experience with these dogs (Clarke et al., 2013).

Finally, the characteristics of a trustee also shape judgement of trust. Gender, education and socio-economic status, local culture, as well as trustee's personality traits have all been shown to affect what information a person recognizes as trustworthy when assessing risk (Sztompka, 1999, Nishikawa and Stolle, 2012).

7.1.2 Trust and social relations

Trusting is a fundamentally social process crucial for maintaining relationships (Möllering, 2001, Sztompka, 1999, Lorenz, 1993). In order to trust dogs, dog owners need to see them as social actors. Previous sociological research described how dog owners indeed see dogs as in this way; as capable of self-awareness, empathy, emotional complexity, aware of social norms and able to communicate (Sanders & Arluke, 1996). Trust can be further described as a "complex relational practice happening within particular socio-political contexts" (Brownlie and Howson, 2005, p. 222). In other words, instead of being universal, trust is typically context specific – I trust X to do Y in the context of Z, rather than just trust X (Uslaner, 2002). Due to

the social nature of trust, it is developed in the course of interactions that are reciprocal– when placing trust, it is expected that the object of trust will return it (Ruokonen, 2013). This expectations implies uncertainty- we cannot be sure that trust will be returned. Möllering (2001) argued that it is precisely those moments of uncertainty which require 'leaps of faith' and that cement social relations. Trust is valuable- it offers a sense of security, encourages creativity, innovation and positive self-esteem (Sztompka, 1999, Giddens, 1991). By contrast, distrust inhibits and limits action, promotes watchfulness and strict control and leads to an introduction of formal precautions and mechanism which enforce rule-abiding (Sztompka, 1999). The value of trust in maintaining social relations is so vast that even when there are no grounds to trust (or indeed evidence suggest not to trust), the information that leads to the conclusion that trust is misplaced may be ignored in order to preserve trust-based relationships (Lorenz, 1993).

7.1.3 Trust and responsibility

Within a given context, a decision to trust is assessed on the basis of instrumental and moral expectations regarding the assessed subject (Sztompka, 1999). Instrumental expectations relate to a trustor's ability to act in a trustworthy manner (i.e. their physical skills and predictability - being able to show coherence of behaviour across different contexts and across time, Sztompka, 1999). For example, a dog owner may be trusted because they are believed to have physical strength and skills to control their dog. Moral expectation enables trusting of the trustor because they are thought to have good moral character: they are believed to be kind, gentle, humane, truthful and fair (Sztompka, 1999). A person may trust their dog because they believe that their dog is inherently good. As shown in Chapter 4, dogs are in fact often seen as pure, gentle and well-meaning. This depiction of dogs is also common in the media and popular culture (e.g. Figure 7.1).

Figure 7.1. *Dogs are commonly depicted as subjects of moral trust, which is reflected in popular depiction of dogs in media. Popular discourse emphasises dogs' selflessness, sacrifice, heroism and willingness to put the wellbeing of others ahead of their own. In: BBC News Online [*https://www.bbc.co.uk/news/uk-england-manchester-43742889].

Not all expectations are equally necessary to develop trust. Their importance is context-specific (Sztompka, 1999). For example, governments are trusted primarily on the grounds of instrumental expectations - their ability to get the job done - and rarely on the grounds of moral trust (a belief that they would get the job done out of principle). Conversely, neighbours are shown to be more likely to be trusted on the grounds of moral trust (Sztompka, 1999).

The moral and instrumental components of trust are similar to conceptualisation of responsibility that emphasise ability to act (response-ability, i.e. the instrumental component) as well as commitment (i.e. the moral component (Brown and Dilley, 2012)). Specifically, response-*ability* requires anticipatory knowledge (Anderson, 2007). Within the context of human-dog interaction this means being able to note what is likely to be a problem for a dog, predict and pre-empt the dog's behaviour while taking into account the pace of interactions, the individual's and the dog's embodied characteristics and the environment within which the interactions are taking place (Brown and Dilley, 2012). This entails developing observational skills and dog handling skills, which require the ability to observe the dog; the physical ability and strength needed to manage the dog; and knowledge of the environment in which the interactions are unfolding (2014, Brown and Dilley, 2012).

Previous research suggests that dog owners can usually readily identify the right thing to do and are committed to their dogs, but often lack skills to be response-able (Brown and Dilley, 2012). However, when an owners bond and perceived commitment to the dog are too strong, "the priority given to an animal's needs may easily outweigh any consideration of the needs of others" (Westgarth et al., 2019, p.642). Response-ability as well as commitment to the dog are therefore developed in the course of interactions and a relationship with a given dog over time which informs ability to act (Brown and Dilley, 2012, Haraway, 2008, Westgarth et al., 2019).

A further link between trust and responsibility lies in the way trust is strengthened by social norms regarding meeting commitments and the belief that the trustor will feel bad for not fulfilling their obligation (Ruokonen, 2013). For example, dog owners trained and supervised their dogs, i.e. strived to present themselves as trustworthy, as they perceived it as their obligation (Westgarth et al 2019). In other words, a sense of responsibility to the trustee promotes trustworthy, reciprocal practice (Ruokonen, 2013, Lorenz, 1993).

7.1.4 Chapter aims

The aims of this chapter are to show how participants assessed safety and managed risk around dogs using trust; how safety was developed and practiced through social interactions; and how the sense of responsibility for others and for dogs helped to ensure and motivate safe practices but also on some occasions compromised them. The Chapter concludes with a discussion of the findings in the context of trust and injury prevention literature and recommendations.

7.2 Findings

Three main themes regarding the use of social relationships and trust were identified (Figure 7.2). Trustworthiness of dogs was assessed by dog owners and other people interacting with them by scrutinising their reputation, appearance and performance. Dog owners were seen as the main source of information about dogs and their trustworthiness and response-ability was also assessed. Safety was negotiated within social interactions with others and perceived through the prism of relations with others and the dog. This relational nature of safety led to

multiple co-dependencies between the dog owner, those who work with or around dogs and the public.

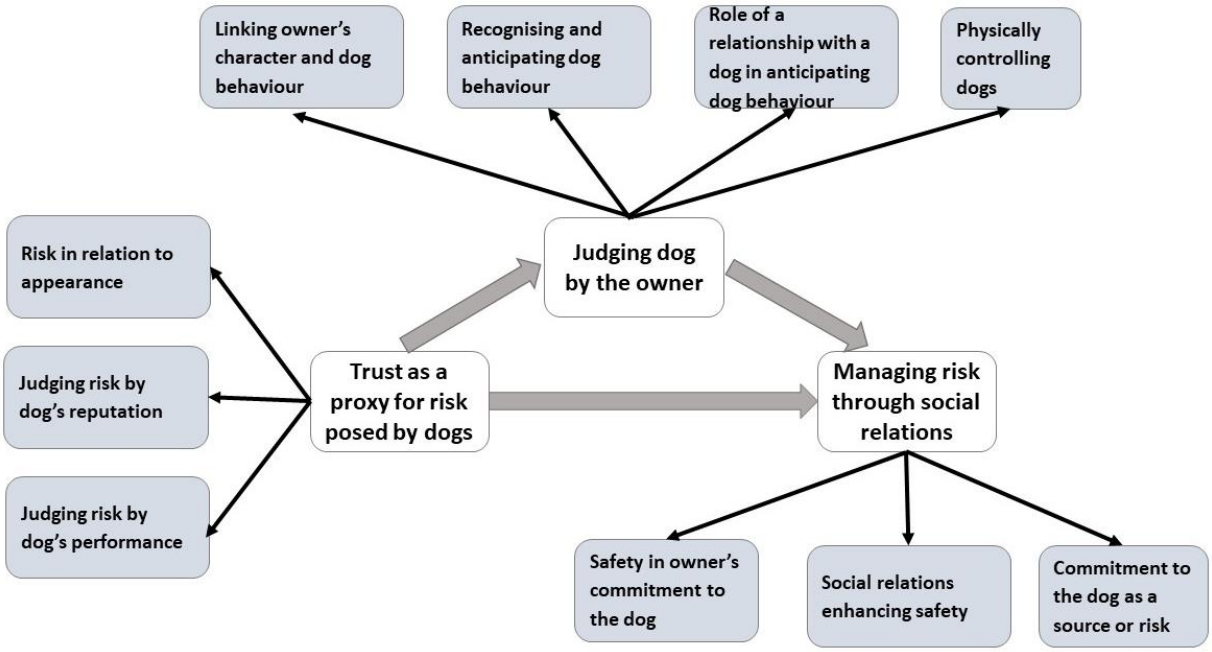


Figure 7.2. *Schematic representation of the role of trust in managing risk around dogs. Trust is used as a proxy for risk posed by dogs and it is judged by assessing dog's and owner's appearance, dog's reputation and performance. Owner is judged with respect to their knowledge and response-ability and safety is seen as a reflection of owner's commitment to the dog as linked with owner's character. Safety was maintained through social relations which relied on trust.*

7.2.1 Trust as a proxy for risk posed by dogs

Risk was assessed via trust, i.e. feelings of trust towards the dog instigated interactions with a dog. Dog's trustworthiness was assessed through a combination of their appearance, performance and reputation. These assessments were framed within broader beliefs regarding the dog's character and subjective experiences with dogs.

7.2.1.1 *Risk in relation to appearance*

Judging risk by appearance was seen most clearly when participants modified interactions with a dog on the basis of dog's breed. The breed stereotypes discussed by YouTube viewers (Chapter 4) were often shared by the participants, and had implications for practice. For example, Alice explained that she has not visited her mother's house in five years as she does not trust her mother's dog. She judged the risk posed by the dog on the basis of their breed and reputation of the breed:

"It's one of these muscly type dogs (…) My mum would say to you, 'You know, the dog is getting older now. You must see that she's got a track record, she's really good.' (…) She still won't see that people are viewing that dog in a totally different way than she views that dog. (…) She can't see that dog has that reputation for a reason." Alice, mum of 3, bite victim.

Alice dismissed the assurance of the individual dog's good reputation and current performance based on her own judgement of the breed reputation and appearance. By comparison, Alice's mother ignored the negative reputation of the breed and instead placed trust in the dog based on its good "track record". This illustrate how personal experience with dogs (Alice was previously bitten while her mother was not), shaped assessment of risk.

7.2.1.2 *Judging risk by dog's reputation*

Most of the time, judgements of risk and trustworthiness were based predominantly on a dog's reputation. For example, Luke' trusted his dog due to the duration of relationship with Dante and observing the dog's behaviour in different contexts:

"I've had him [Dante] for 11 and a half years, and he's been exposed to dogs individually, dogs as a group, people as a group, towns, cities, sheep, horses, police cars with sirens, fire engines, trains (…). He's been shown aggression by other dogs, and has never once shown the slightest inclination to be aggressive. (…) So I knew he was going to be okay." Luke, dog owner and father of 3 year old son.

However, participants often alluded to the tension between positive reputation, which encourages trusting of their dog and promotes interactions, and the dog's nature which could undermine the trust:

"When people go to the elocution lessons, you're training the [local accent] out of them. They're talking a little bit more upper class. Every now and then they'll be a little slip up where a primal urge will set in and they'll just revert right back to what they know naturally. (…) I think that's the same with a dog. You train it to a certain degree. (…) You train a dog to inhibit nature. But then maybe every now and then a little trigger point (…). Then everything that they've been taught might go out the window (…). You've got your nature, in there (…)." Mike, owner of 2 dogs, bite victim.

Trust in dogs on the basis of their reputation was developed during the course of the relationship with a dog, i.e. by participating in shared activities. Similar to the observations made in Chapter 4, in real life a dog's instinct was also seen as limiting their trustworthiness, and dog training was seen as increasing the dog's ability to control their behaviour, but only up to a point.

7.2.1.3 *Judging risk by dog's performance*

Judging the risk posed by dogs by observing their body language (as described in Chapters 4, 5 and 6), is a good example of making judgements based on a dog's performance. When making these assessments, the breed was frequently considered, illustrating how participants built trust on the basis of performance and appearance. For instance, Claire explained how trusting a breed (i.e. assessing risk through appearance) and a dog's reputation meant their current performance was interpreted as breed-typical rather than indicative of risk:

"I noticed that the dog was quite jumpy (…) biting the bars. And just being a really... sort of stupid staffie. (…) And that's often just something that I think the breed tends to do (...). So I wasn't sure if he was just being silly at this stage or getting wound up. (…) [We] gave him an injection. Absolutely no problem at all, didn't react to the injection. (…) And then we went to put him back in the kennel. The muzzle had been removed, because he hasn't tried to attack in any obvious way. He then, span round and (…) just started attacking me. (…). We should have kept the muzzle on. But (…) you know, previous to that it never ever had any CARE written on its notes or anything. It's always been a nice dog to come in a practice" Claire, bite victim, veterinary nurse.

The dog's initial performance (jumping and biting bars) was ambiguous and worried Claire, but she "was not sure" how to interpret it. As a result, the dog was muzzled after being taken out of the kennel for the injection. Subsequent good behaviour during the consultation and positive reputation meant that his initially ambiguous behaviour was seen as normal for the breed. This led to removing the muzzle, which eventually led to a sustained attack on Claire. This example shows that when the performance of a dog is ambiguous, dog's reputation may skew the assessment of the risk posed by the dog.

7.2.2 Judging risk by the owner

Reputation and safety of dogs was also assessed via proxy, i.e. by assessing trustworthiness and response-ability of dog owners. Owners' moral character, knowledge of dog behaviour and of their own dog, ability to recognise, anticipate and control dog's behaviour were scrutinised.

7.2.2.1 *Linking owner's character and dog behaviour*

All participants believed that dog owners play a crucial role in maintaining and managing safety. Their behaviour was perceived to directly impact on the dog. Many participants indeed expressed a view that owner's character translated into the dog's reputation:

"It's not necessarily the dog that's dangerous, it's the owner. It's the way the owner brings the dog up." Adam, Delivery Company, bite victim.

This perception was also reflected in attitudes of dog shelter visitors who often thought that dog's behaviour would be different with them, and that their character would have a positive impact on a dog:

"(…) This was a white American Bulldog and it was covered in Jasmin's blood. And a lot of members of the public were coming up to us asking, 'What's going to happen to the dog?' And we say, 'It's going to get put to sleep.'

'Oh, I'll take it home. I'll put it [in my car].' 'All he needs is love'. (…) we could see how Jasmin's arm works [as the wound was so deep muscle tissue and bones were visible], because it just

ripped that much skin off her own flesh. We just couldn't believe the way the public were reacting like that (…)" Focus Group Discussion, Dog Shelter.

Dog shelter staff expressed their frustration with the view that problematic dog behaviour was a result of an owners' character and behaviour alone. They thought the public's over-confidence and a belief that they could safely take care of the dog was naïve and introduced risk. Shelter staff believed that dog-ownership practices influence the behaviour of a dog, but expressed a more holistic view that the behaviour can also be influence by a dog's prior experience, genetics, history etc.:

"Except it's not just the owner, is it. It's how that dog was bred, what experiences it had even before it got to that owner. Sometimes it's even genetics- you hear about lines of dogs that are more dangerous. By the time they're here it's all those things" Lizzie, Focus Group Discussion, Dog Shelter.

Owners of biting dogs often internalised the view that the behaviour of a dog and a character of the owner are connected. They experienced feeling stigmatized and embarrassed about their dog's behaviour. These owners described worrying that people would judge them or think that they had a dangerous or bad dog. For example, one owner described lying and saying she had been attacked by her mother's cat to avoid admitting that her own dog bit her in the face, and several other owners explained how they felt embarrassed to admit that their dog had bitten.

7.2.3 Recognising and anticipating dog behaviour

Anticipatory knowledge required for safety included the ability to predict what a dog is likely to do, i.e. being able to recognise particular behaviours indicative of risk and being able to consider a range of behaviours that a given dog may be capable of. Participants believed that other dog owners (but typically not themselves) could not recognise dangerous behaviours:

"They always say to you, "Oh, it's friendly," but then they're biting your calves. "Excuse me. Your dog is actually physically biting." "Oh, it's never done that before." "Well, it's doing it now." Ben, Delivery Company.

Most participants described an experience of other dog owners reassuring them (erroneously) regarding their dog's friendliness and acting surprised when a dog did bite, thus showing inability to anticipate how a dog will act. This provoked a mistrust towards other dog owners, which was particularly strong among dog shelter workers:

"(…) you don't necessarily trust whoever's on the end of the lead, because a lot of the time if you've got a dog and they're like, "Oh, is he okay?" They're like, "Oh, yes. Yes, they're fine," and the dogs are saying hello, and then you're looking at the body language like, "Your dog doesn't like that." Whereas they're like, "Oh, yes, they're fine." So, I think we're more trusting of each other, whereas less so of the public." Dog Shelter, Focus Group Discussion.

In addition to lack of knowledge, inability to anticipate how a dog was going to behave was thought to depend on prior experience with dogs. Participants believed that that non-owners cannot interpret a dog's body language and anticipate dog behaviour for this reason:

"(…) someone who hasn't got a dog, they see the teeth and you know he's only excited or he's going to jump up, but his teeth are all open and his mouth is open. I think people think they're going to get bitten and then you see them either freeze up and the dog can sense it. Whereas you know he's only really happy to see that person" Harriett, dog owner, bite victim.

Harriet described her dog "smiling" (Figure 7.3), i.e. baring their teeth when excited. She interpreted this behaviour as her dog being friendly- she described knowing this because of her experience with dogs.

Figure 7.3. *An example a submissive grin, i.e. a smiling dog. Context in which this behaviour occurred (owner returning home), vocalisations, and other behavioural signs suggests that the dog was very excited and not aggressive. Photos taken by Sara Owczarczak-Garstecka.*

7.2.4 Role of a relationship with a dog in anticipating dog behaviour

Prior experience and strong relationships with dogs were also believed to lead to habituation to dog behaviours and inability to anticipate how a dog may behave:

"(…) all of a sudden the grandkid comes round visiting, and you end up with a West Highland Terrier hanging off its face. Because the dog doesn't like children, but the old person is very set in their ways, and is a little bit blind to the misbehaviours that their dog shows." Luke, dog owner, bite victim.

Luke explained that other owners cannot anticipate how a dog will behave because the problem behaviours may have become normalised. Interestingly, Luke himself normalised the problematic behaviour of his dog. Luke described his dog, Dante, as frequently snatching mail from the letterbox, lunging and barking at the door. Based on the dog's reputation and his perception of the dog's motivation, however, Luke believed Dante would not bite, even though the evidence of his dog's behaviour would suggest it was quite possible:

"Interviewer: Is there any chance that he could nip at the fingers of someone putting something through your letterbox?

Luke: I would say no. What he wants is what's coming through the post box. As soon as it's through, as soon as there's even a fraction of a bit of paper through, it's that bit of paper that he wants. He's not interested in who's putting it through, or what's on the other bit of that paper." Luke, bite victim.

As Luke did not think Dante would bite, and given the effort required to change a dog's behaviour which he discussed further in an interview, he decided not to intervene. This suggests that while it was easy to see how others should be pre-empting dog behaviour, the relationship with his own dog makes it harder for him to accept the potential of his dog's risk of biting from its behaviour.

Staff in the dog shelters brought up the similar example of dog owners filming children "*crawling all over the dog"* (Focus Group Discussion, Dog Shelter A), as an illustration of dog owners not being able to *anticipate* dog behaviour. Dog shelter staff emphasised that while this practice is seen as cute and a sign of a child bonding with a dog, they viewed it as

dangerous. They believed dogs in these situations may often be distressed, which could put the child at a risk of a bite.

Participants admitted that even when they could recognise and anticipate that a dog may pose a risk, they were not always able to respond appropriately, due to their attachment and affection for the dog:

"So I was leaning over him. (…) I think I went like an urge, like 'cmooook', [shows how she grabbed and kissed the dog], like that, like that kind of thing in his face. In a kind of like manic, like 'awwww, you are... what a little doooog!'" Beatrice, dog owner, bite victim.

Beatrice described that her family never handled that dog in the way she did as they were aware of his behaviour problems. However, in the spur of the moment, affection for the dog took over her response-ability.

Alice suggested that a strong bond with a dog could cloud owners' ability to anticipate behaviour and made them unable to introduce what she saw as adequate safety measures:

"It's the conceit of people, they just think, "Oh no, not us." I suppose it's similar to a child that's bullying someone, "Not my child." It's the same mentality, total disregard." Alice, bite victim.

7.2.1 Physically controlling dogs

In addition to skills needed to recognise, anticipate and pre-empt dog behaviour, participants described the importance of the physical ability to control a dog as a basic requirement for trusting the owner and one another. The owner's surveillance skills (discussed in Chapter 6) were seen as crucial in being able to physically control the dog:

"*Perhaps, just a member of the public didn't realise (…) [that a dog was not locked away]? Or were not aware (…)? Perhaps, they put it in another room, but didn't shut the door properly? (…) I think the member of the public did try and get the dog back inside, but not as quickly as perhaps they could have done.*" Dan, Delivery Company 1.

In this example, Dan shows that dog owner's lack of surveillance skills coupled with lack of handling skills meant that they did not pre-empt their dog's behaviour, which resulted in a bite.

Some groups of owners, specifically children or infirm dog owners or handlers, were seen by those working with or around dogs as a particular risk to others due to their inability to control a dog:

"(…) as we saw today, people bring the dog to the door. Now, the dog may be a lot stronger or faster than the person. It might be somebody who's a little bit old, it might be somebody who's infirm. (…) it might be a child, but that dog is excited, it gets to us and it bites us then." Adam, Delivery Company 1.

Not being able to recall a dog was an often cited as an example of dog owners being seen as not response-able:

"*What you get, a lot, of people is, "Oh, the dog is fine, the dog is fine." Then they're shouting it over 10 times and the dog is still not coming back. Let me tell you, that means that your dog is not under control*". Alice, bite victim.

Paradoxically, believing that dog owners lack anticipatory knowledge and cannot control their dog worked as risk management strategy. For example, participants who shared this view and were fearful of dogs avoided parks and other areas where dogs were common. Professionals who enter private properties in the course of work often, by default, took actions assuming that the owner would not control the dog. For instance, they stepped behind the gate after knocking on the door or called the owners and ask them to control the dog ahead of their visit, assuming that the owner would not take these precautions unless prompted. This shows that response-ability was seen as owners' physical abilities as well as knowing how to manage a dog.

7.2.2 Managing risk through social relations

7.2.2.1 *Social relations enhancing safety*

Safety was experienced socially. It was perceived to be interconnected, negotiated through social relations and co-operation with others. Social relations also shaped how safety was experienced.

As described in Chapter 6, safety at work was dependent on trusting others to do their job, and it required consistent adherence to work protocols and within an organisation safety was seen as dependent on social support and being able to trust colleagues. Outside of a work context, co-operation was also crucial for managing dogs. A lack of family support in managing a dog was given as a reason why a dog was eventually euthanised:

Tom: "(…) The thing was I had to accept nobody in my family wanted this fucking dog except for me, which was heart-breaking. (…) My family is completely disengaged from him. Not hostile, absolutely never hostile(…) [I felt] fairly wretched, really, because I would have kept him. I would have kept him.

Interviewer: You would manage?

Tom: Yes. Not because I'm special… (…) when you've got a dog, and the dog has got some challenging behaviours, it works well when you're all working as a team or you're on your own. If you're not working as a team and you're not on your own, that's when mistakes happen actually." Tom, owner of a dog that bitten someone else.

Tom explained that safety can only be achieved through co-operation, by having the whole family committed to the dog. Lack of commitment was interpreted as unsafe. Tom was willing to make compromises in his lifestyle and tolerate the inconvenience linked with managing a dog with behaviour problems because of the benefits that he derived from the relationship with Roar. At the same time, he saw that his family does not have the same relationship with him and therefore managing Roar became a burden. In this sense, safety was judged from the perspective of social relations. In the case of Roar, Tom judged that his family relations with the dog were not strong enough to adhere to the regime that could keep the risk at bay. By contrast, Boos' owners described above, saw living with Boo as an acceptable risk, as their relationship with Boo was strong. A change in social relations within a family can also affect the perception of risk around dogs:

Sandra talks to me about being pregnant. "Even just before going off for maternity leave I was fine (…) but I just lost it when I came back. I was fine with puppies, but with big dogs, Bulldogs, I was questioning it more. Definitely more aware of what can happen if I get bit" Fieldwork notes, Dog Shelter.

In shelters, making sure that dogs were safe to interact with was seen as important to ensuring the wellbeing and health of the shelter staff but also to avoid negative consequences of a bite for the dog:

"*So, the way I view it, as much as staff safety, and if I'm talking on a personal level, a bite incident might heal but a dog could lose its life."* Kerry, Dog Shelter.

Managing and maintaining safety was seen as interconnected because past behaviours were described to affect current behaviours. Most participants discussed how different stressors in a dog's life may add up over period of time, leading to an unexpected event triggered by seemingly innocuous thing further down the line:

"If the dog grumbles you don't want that person to push the dog. Even if they don't get bit it could be the person the next day, or the next day. Or if people ignore a growl, or ignore these subtle signs, they could be the triggers to somebody else getting bitten" Mary, Dog Shelter.

Risk management required co-operation between different organisations and stakeholders, between colleagues, and within a family. For example, safety was discussed as an outcome of: the work of trade associations that helped to negotiate with the employer; health and safety regulatory bodies, which implement laws around safety at work and develop best practice guides; suppliers and designers of safety equipment; researchers and non-governmental organisations supporting dog safety; and the public.

In summary, safety was experienced through the prism of social relations and practices relevant to negotiate safety but were also carried out socially.

7.2.3 Safety in owner's commitment to the dog

Owners talked about the commitment they had to their dog due to their relationship, and how this was balanced with their responsibility to protect others. Taking on responsibility to address a dog's aggressive behaviour was an important aspect of expressing commitment to an individual dog:

"I wanted to sort it because he was my dog, and I wanted to take responsibility for it. (…) I'd taken on the dog, we were taking on Hatch, and that he was mine, and I'd do anything to help him. Yes, like it's my moral responsibility." Melissa, owner of a biting dog.

Even if working to improve dog behaviour was not motivated to ensure safety of others, it could have this effect. The relationship with a dog also sometimes encouraged safe practice as participants described that they could only maintain their commitment to the dog if it does not impact on the safety of others. For instance, Carol explained how the sense of commitment to her dog primarily motivated her decision not to euthanise Boo, a large dog who by her own admission was dangerous and had bitten her multiple times. She explained that her commitment was scrutinised with respect to assessing safety of others:

"I couldn't have a dog put down anyway. Anne [dog trainer] sat here and said, "We'd understand." I couldn't do that. He's 10½, he's allowed to live out his life. If he did that to Grace [another dog] or to any other person I think we'd respond differently." Carol, owner of a biting dog, bite victim.

Carol believed that her decision did not affect the safety of others' and helped her to justify keeping Boo. Her commitment to Boo was effectively conditional on perceiving that she was able to protect others, but it is not known whether this was truly the case or whether her view would change if he did bite someone else.

7.2.4 Commitment to the dog as a source of risk

Participants who had a strong relationship with a dog with a history of aggression commonly invested a considerable effort into maintaining a positive image of their dog, which supports Alice's belief that owners "disregard" the true behaviour of their dogs. For example, Boo, owned by Carol and Matt "nipped", scratched and bruised them so often that they could not count how many times they were "really bitten" or when the last bite occurred. He had also bitten someone so severely they required hospitalisation. They discussed Boo's character as separate from his behaviour:

"Matt: It [bite to Carol] was nasty. I felt he was unpredictably dangerous in that sort of situation. (…) But it was just one [off]. He's never been aggressive like that, they've always been situational.

Carol: There's a difference, he's not a worrier. He's not somebody who gets his pray by the neck and shakes it or anything like that.

Matt: (…). I don't think he's an aggressive dog. He doesn't go and attack somebody. These are instant occasions where [he] reacts to a certain situation.

Carol: Where the stress suddenly becomes too much for him.

Matt: It's not like the mauling (…) children. They are almost immediate responses, we think he has short-circuits. Which explain why he sometimes behaves [like that]. It's transferred aggression.

Carol: He doesn't think aggressive thoughts. It's just something that comes over him suddenly, "Whoosh". Then he stops and he's almost sorry". Carol and Matt, owners of a dog who has bitten.

Boo's owners bracketed his aggression as rare (even though by their own admission it was frequent); they re-presented it as something triggered by the context. They did not see Boo's behaviour as driven by malicious motivation, which in their view would qualify him as a dangerous, aggressive dog. Instead, throughout the interview they focused on his "loyal" and "loving" character and positive experiences they have with Boo. They ascribed his problem behaviour to his biology and explained it in biological terms ("transferred aggression" caused by "short-circuits"). Boo's behaviour was also anthropomorphised- the owners spoke of him as "somebody" and explained that "he doesn't think aggressive thoughts". The way of talking about Boo's behaviour helped them to accept it and built a committed relationship with Boo. The relationship with the dog did however clearly put them at risk.

Other participants explained that as a result of a relationship and commitment to a dog they did not report a bite to the police (which was seen as endangering the dog). For example, Elly, a bite victim, described that despite feeling responsible for public safety, she did not report being attacked by a familiar dog to the police. She expressed that this made her worry that if another bite occurred, she would be "*co-responsible*".

A number of participants perceived meeting a dogs' needs by walking them in public as a priority over public safety. For instance, Georgia explained that her dog does *"not like children"* and that *"she'd never forgive herself if her dog bit a child"*. She described protecting

children from her dog by not letting them near him. However, she also said that she did not want to walk her dog in parks frequented by other dog owners as she feared they are visited by *"dangerous dogs"*. This meant that she walked her dog in busy locations, often frequented by children. Georgia also did not muzzle her dog. When asked why, she said:

"(…) if you're taking out a muzzled dog and they get attacked by another dog, they've got no defences, have they? I don't really like muzzles. (…) We take balls and sticks and throw them, you can't do that with the muzzle on. It's his favourite game." Georgia, Delivery Company, bite victim and owner.

Georgia justified not muzzling her dog as she thought that by muzzling him, his welfare needs are not met. She prioritised responsibility for her dog over that of the public, which again illustrates how a relationship with a dog can compromise safety.

7.3 Discussion

Everyday interactions with dogs are riddled with uncertainties. As a result, those interacting with dogs are involved in ongoing risk assessments. Decision making in daily life draws on tacit, experiential knowledge and skills people develop through practice (Zinn, 2008). In this Chapter specifically the role of trust, responsibility and social relations in negotiating safety around dogs was discussed. Trust in a dog, judged by a combination of their appearance, reputation and performance, was seen as a proxy for risk. Dog owners were also perceived as an indicator of danger posed by dogs. Dog owners' character, general knowledge of dog behaviour and of their own dog's behaviour were assessed. Trustworthiness of dog owners was also scrutinised with respect to their responsibility, i.e. their commitment to their dog and ability to respond to dog behaviour (response-ability). Occasionally, a strong relationship with a dog hindered practices required for safety. Risk was identified from the perspective of social relations and it was managed through social interactions.

7.3.1 Using trust to assess risk

Trust was identified here as an "in-between" strategy for recognising the risk posed by dogs (Zinn, 2008). This means it was based on a range of situated, positive prior experiences with

a dog but also did require “a leap of faith” (Möllering, 2001). Trust was constructed by scrutinising trustworthiness of dogs, which was assessed with respect to their appearance (mainly their breed), reputation and performance. Dog breed has an influence on the perception of a dog’s behaviour (Clarke et al., 2016a, Gunter et al., 2016). Popular media commonly represent dogs and specifically dog aggression in a stereotypic manner, as a characteristic of particular breeds (Kikuchi and Oxley, 2017, Cohen and Richardson, 2002). Not surprisingly, here participants relied on these breed stereotypes (also discussed in Chapter 4) to judge risk. This illustrates how social norms, media representation of dogs and prior experience with a given breed may shape interpretations of dog behaviour. Surveillance techniques (described in Chapter 6) played a part in building trust, as they were a vehicle through which a dog’s performance was understood. Participants used all of the above lenses when developing trust and judging risk posed by dogs, however occasionally they prioritised dog’s reputation above other perspectives. As reputation of a dog was developed in the course of human-dog interactions over time, relying on a dog’s reputation reflected the importance of judging risk in the context of social relations (with a dog).

Dependence on trust when identifying risk has its limitations. Judgement of risk can be inaccurate when a person is overconfident regarding the information they are using to make their assessment (Tversky and Kahneman, 1973). This overconfidence bias suggests that people are likely to be confident in their judgement even when it is made on the basis of restricted observations or knowledge. Here, shelter staff who had experience with many dogs and in a range of contexts, commonly relied on others for information and help. By contrast, dog owners, whose knowledge and experience were often limited to their own dogs, were generally confident in their assessments, which prompted them to offer sometimes misplaced reassurance. For example, owners informed others that “the dog is fine” when in fact it did bite. Indeed, experience with dogs has been shown not to improve knowledge and ability to recognise dog behaviour in experimental context (Tami and Gallagher, 2009). The current study shows that paradoxically, experiential knowledge could indeed put people interacting with dogs at risk by improving their confidence around dogs.

Moreover, when the judgement of trustworthiness based on the appearance, performance and reputation was incongruent, participants did not always fully appreciate the observed, atypical behaviour and prioritised knowledge gained in the course of previous interactions. A

history of a relationship with a given dog encouraged interacting with the dog now even if their current behaviour was judged as ambiguous. Together, this could perhaps help to explain why previous studies identified that dog owners often did have knowledge of dog behaviour and knew about the contexts in which a dog was likely to behave in an aggressive way, but carried on interacting with a dog without any changes (Westgarth and Watkins 2015). Perhaps they based their interactions on the grounds of a dog's reputation, without applying behaviour knowledge to the given situation.

By contrast, distrust, normally discussed as having a negative impact on wellbeing and behaviour (Sztompka, 1999), here acted as a strategy for managing risk through avoidance (e.g. avoiding public places or entering private properties). Although this strategy came at a cost (it restricted the use of public space), it was often effective.

7.3.2 Challenges of commitment

Perceptions of responsibility contributed to the judgements of trustworthiness and risk. Responsibility was scrutinised with respect to an owner's commitment to the dog and being able to respond to the dog's behaviour adequately. Identifying oneself as individually responsible for risk management (i.e. responsibilisation) (Zinn, 2020, Beck et al., 1992) and commitment to the dog motivated a number of owners to take actions to minimize the risk a dog posed to others. These owners saw their dog's safety as dependent on safety of others.

However, as a result of individualisation of risk and responsibilisation, individuals also attributed dog's problematic behaviours to themselves, largely ignoring other factors which impact on how a dog acts (see Chapter 2). Consequently, dangerous dog behaviour was stigmatised and threatened the identity of the "responsible owner". To manage their identity of a "good" and "committed" and "responsible owner", participants endured aggressive behaviours of a dog, which put them at a considerable risk. To this end, they relied on a range of "excusing tactics" (Sanders, 1990) that helped to accept the risk a dog posed by normalising their aggression. Owners emphasised the context in which aggression occurred, describing dog behaviour as out of a dog's control and separated it from its character. In addition to normalising aggression, being habituated to it also diminished the perception of risk. A

number of dog owners also did not admit or act on dog's dangerous behaviours in order to avoid others seeing their dog in negative terms.

Previous research suggests that a potential outcome of a strong commitment to a dog is seeing responsibility for the dog and the public as incompatible (Westgarth et al., 2019). Here, it was clear that for some participants', commitment to their dog was greater than the concern for others. Prioritising the needs of a dog over that of others and protecting own identity instead of reducing risk a dog poses illustrates that when managing safety, risks are selected rather than reflective of empirically assessed dangers (Douglas and Wildavsky, 1983, p. 83). Douglas argued that risk selection is "connected with legitimating moral principles"- what is identified as risk reflects a choice of what is important (Douglas, 1983, p. 69). For owners who have a close bond with a dog, the risk of not meeting their needs or losing an identity of a good owner was greater than the risk that a dog posed to themselves or the public.

7.3.3 From commitment to response-ability

Previous studies suggest that generally, dog owners are responsible- i.e. they know what is the right thing to do, but they are not always response-able, i.e. they do not always know how to do that (Brown, 2014). For example, while dog owners know that dogs should not worry sheep, they fail to control their dog if they do not anticipate the sheep's presence, showing how poor anticipatory knowledge impacts on practice (Brown, 2014). Response-ability is developed within a specific contexts and environments, rather than with reference to general, universal and shared moral principles (Brown, 2014, p. 43). In addition, owners do not always think that they personally need to carry out the responsible behaviour; personal circumstances help owners justify their practice and deviation from what they see as responsible (Westgarth et al., 2019). Here, for example, participants also knew that it is not responsible to leave children with dog alone but did not always think this was crucial in their context. They thought that other people should muzzle dangerous dogs, but could justify not doing so themselves. This is similar to previous findings, where dog bite victims (who often were owners of biting dogs), believed that a bite would not happen to them, and thus did not take any precautions (Westgarth and Watkins, 2015). The relationship with a dog clearly impacted on a participant's response-ability and consequently, safety-related practices.

Participants typically assumed their dog will continue to behave in the same way even if the context of interactions or broader circumstances have changed. This again shows how response-ability is related to judging dogs by their reputation. As a result, participants often did not pre-empt dog behaviour by e.g. securing the dog behind closed doors or preventing the dog from meeting with a person.

The Dangerous Dogs Act (1991), the Health and Safety at Work Act (1974) as well as organisational procedures which dictate how risk should be managed within a company (Chapter 6) define risk management as an individual responsibility. However, responsibility for dogs is often shared within a family (Westgarth et al. 2019). As demonstrated here, in practice safety was negotiated through co-operation with others and co-dependent responses to dogs and cannot be extracted from social interactions through which it is achieved. Moreover, acceptability of risk was also judged through the prism of a relationship with a dog. Relations with others, especially family and trust in co-workers' skills also influenced the risk participants were willing to take around dogs. Rather than individual, responsibility for negotiating safety in relations with dogs could be better described as response-ability that is shared and dispersed within a network of human and non-human actors, as suggested by Haraway (Haraway, 2008, p. 71) where actions of each actor have an impact on management of a dog.

7.3.4 Implications of trust and responsibility for furthering dog bite prevention

Whilst legally, the dog owners are ultimately responsible for their dogs, the shared nature of practices needed for negotiating safety could be reflected in dog bite prevention. This could be done by identifying multiple targets of bite prevention education and campaigns whilst also tailoring the message according to the context of their interactions and the role they could play in negotiating safety. While at present most dog bite prevention campaigns are aimed at children or dog owners, given that virtually everyone accesses public space, campaigns should have a broader scope. In addition, the preventive effort should not be seen as a responsibility of a handful of organisations that work to improve dog welfare, as approaches that build on capacity of multi-agency partnerships are more effective in reducing injuries (Hemenway, 2009). This is possibly because a coordinated effort is more likely to

address social norms which promote safe behaviours, than a smaller scale, local campaigns (Hemenway, 2009). In addition, although it would be challenging to encode this shared sense of responsibility in law, it could be included in specific work-related policies. For instance, work safety procedures should be written from the perspective of a co-operative rather than a lone worker. These procedures could be encouraged by e.g. rewarding the safest teams (rather than individuals) and training which emphasises co-operation.

To further bite prevention it is also important to develop a shared, public understanding of responsible dog ownership. This study shows that paradoxically, it is the owners who consider themselves as most responsible and most committed to their dogs who may generate the most risk in terms of dog bites. Instead of asking dog owners to be responsible, is important to provide clear instructions of what is meant by responsible practice e.g. putting dogs on the lead, seeking professional behaviour help etc. (Westgarth et al. 2019). Furthermore, this study suggests that non-dog owners who do not have a positive connection with dogs, expect (responsible) dog owners to be able to ensure that their dog does not approach strangers when in a public space. This implies that to reduce the public conflict between dog owners and non-owners, dog owners need to be able to reliably recall their dogs. Consequently, improving dog owners' response-ability, e.g. through a provision of affordable and accessible dog recall training could improve dog safety and reduce conflict over the use of public space. Perceptions of the acceptability of dogs meeting strangers in public spaces should also be addressed, as participants believed that not all owners are aware that other people may not want to meet dogs in public, or wish their dogs to interact with people.

Dangerous dog behaviour was seen as stigmatised which hindered help seeking and encouraged taking risks. To address this stigma, the complexity of interactions which lead to a bite need to be emphasised. In addition, help-seeking behaviour could be modelled by e.g. examples of asking for help with a dog in popular TV dramas or by engaging social media influencers in a campaign which helps to signpost dog owners to helpful resources (Michie and West, 2013). At present, resources regarding dog training and behaviour are not regulated, which means that dog owners seeking help often cannot identify reputable, verified information. Developing a central hub with verified evidence-based resources and advice, as well as information on how to find certified local dog trainers and behaviourists, could be helpful.

Finally, there is a need to raise awareness on how the owners' relationship with a dog leads to over-confidence in interpreting their behaviour (believing that "this won't happen to me", Westgarth and Watkins, 2015). This potentially makes it very hard for owners to imagine how a dog may respond (and pre-empt their behaviour). Most education campaigns focus on teaching how to understand dog body language or outlining high-risk interaction contexts (e.g. disturbing a dog while eating, (Meints and de Keuster, 2009). Education should be extended to include raising awareness around biases which make predicting behaviour of an owned dog hard, and inherent uncertainty regarding these predictions, in particular when they are based on limited experience with dogs. A target campaign which illustrates how triggers for aggressive behaviours may stack and result in dogs acting out of character could help to address this perception. For example, animal welfare charities could consider a campaign explaining how dogs may behave differently around Guy Fawkes Night or New Year's Eve when many dogs may be more anxious due to sound sensitivity and fear of fireworks (Mills et al., 2012). As dog owners are likely to see that their dogs behave differently then, a timely campaign could help to explain why dogs may not always behave in an expected manner, and enable owners to appreciate limits of their own assessment and encourage them to pre-empt dog behaviour. In addition, education messages tend to focus on early socialisation and training classes for dogs. It may not be feasible to teach owners skills needed for their dog to maintain a robust response to "leave it" or recall commands through adolescence and adulthood, where age-related changes lead to dogs displaying more challenging behaviour and being more easily distracted than when a puppy. Educations and training should therefore be portrayed as ongoing and life-long part of human-dog interactions.

7.4 Conclusion

In this Chapter, it was argued that as interactions with dogs are varied and do not follow a script, risk cannot always be assessed and managed through procedures. It was shown how trust can be used as a proxy for assessing risk in interactions with dogs as it helps to make sense of the present dog behaviour in the context of a person's experience with dogs or a given dog, and knowledge of the dog owner. This short cut assessment can be helpful and accurate, in particular where participants had a broad experience with dogs, but it may also be misleading and lead to overconfidence in judgement. Trustworthiness of owners was also judged by scrutinising their responsibility. Negotiating safety was sometimes seen as difficult and time consuming and a sense of responsibility for the dog and others helped to motivate positive behaviours (such as dog training). Simultaneously, commitment to the dog was occasionally used to justify practices which generate risk to the public but were perceived to improve wellbeing of a dog. Overall, owners could identify the responsible courses of action,

but did not always follow it as they thought the necessary safety measures did not apply to them or because of they lacked necessary skills (response-ability). Strong bonds with a dog had a potential to improve safety if they led to knowing one's dog well and being able to pre-empt their behaviour. However, they also contributed to some risky practices as owners thought precautionary measures did not apply to them. This research extends understanding of in-between strategies for risk management by showing how in practice trust is assessed, and by highlighting the links between practical assessments of trust and responsibility.

Bite prevention could be improved by raising awareness about limitations of trust-based approaches, and in particular, how a strong relationship with a dog may hamper assessment of risk by contributing to a belief that "this won't happen to me" (Westgarth and Watkins, 2015). Human-dog relationships including the relationships between non-dog owners and dogs in public spaces, could be enhanced by improving dog owners' response-ability such as practical training skills.

8 "If you're calm, the dogs will be calm". Intuition, body techniques and emotional management in negotiating safety around dogs

This Chapter builds on Chapter 7 and highlights an additional "in-between" (Zinn, 2008) method for negotiating safety around dogs: use of intuition and emotions to identify and manage risks. By highlighting the importance of practice in managing risk around dogs, in this Chapter, I elaborate further on the concept of response*ability* (Brown and Dilley, 2012) introduced previously.

8.1 Theoretical background

8.1.1 How emotions shape practices

De Waal's definition of emotions is used here, as it was developed in the context of explaining both human and non-human animal behaviour (and thus, can be applied to both dogs and their owners). Emotions are defined as:

"[T]emporary states brought about by external stimuli relevant to the organism, marked by specific changes in body and mind—brain, hormones, muscles, viscera, heart, alertness, etc etc" (De Waal, 2019, p. 85).

Moreover, De Waal argues that:

"[I]nstead of [a] one-to-one relation between an emotion and ensuing behaviour, emotions combine individual experience with assessment of the environment to prepare the organism for the optimal response" (De Waal, 2019).

In this sense, the relationship between practice and emotions is bidirectional: emotions shape practices and are shaped by practices.

Emotions are also embodied – they are experienced in the body. The subjective experiences of emotions are defined as feelings (Panksepp, 2004). For example,. the feeling of anxiety is linked with a physical experience of rapid heart rate, sweaty hands and breathing difficulties (Damasio, 1996). Over time, these physical experiences become "somatic markers" associated with given situations; thus, when assessing risk, the "somatic markers" contribute

to feelings and influence behaviours, enabling sub-conscious but often accurate assessment based on a feeling (Damasio, 1996). In this sense, corporeality of the body shapes emotional experiences, but also cognitive process, actions and practices. The "somatic markers" add to development of an intuition, defined as "tacit knowledge and pre-conscious awareness of reality" (Zinn, 2008:443). Intuition is grounded in the complex skills to recognise patterns and deviations on the basis of cumulative experience, and provides an ability to respond rapidly without a conscious deliberation (Zinn, 2008). Consistent practice strengthens intuition by shaping emotional processing and appraisal of situations and by helping to develop stronger "somatic markers" to guide behaviours (Damasio, 1996). Emotions are thought to be contagious and emotional contagion is defined as "transfer of emotional states to others which leads them to experience the same emotions as those around them" (Kramer et al., 2014, p. 8788). The transfer may occur on a physiological level (e.g. through olfaction) and it can be subconscious (e.g. when a person is responding to micro-changes in another's facial expressions (Kramer et al., 2013). Emotional contagion can also occur in response to another person's behaviour and practices (Kramer et al., 2013).

Regulating and drawing on emotions for work and in other contexts

Most work involves control and regulation of bodies but also, to an extent, control and regulation of emotions (Hochschild, 1983). Emotional regulation is possible through changes in own behaviour (Kramer et al., 2013). For example, taking confident poses has been argued to improve one's confidence ahead of a stressful task (Carney et al., 2010). Regulation of emotions at work can be seen when a person working at a reception desk is required not only to pick up phones, type notes but also supress their feelings of anger with a customer and projecting the appearance of being eager to help (Hochschild, 1983). Emotional labour is defined as management of own and others' emotions through conscious and unconscious mental effort and practices aimed to change personal feelings or emotions, so they are in line with the employers' needs or social expectations (Hochschild, 1983). Here it will be argued that emotional labour is crucial for negotiating safety in human-dog interactions.

The theory of emotional labour borrows from Goffman's (1956) theatrical metaphors which describe the nuances of emotional regulation through action. Actions that can be observed could be likened to the "front" or performance (Goffman, 1956). These practices reflect

cultural norms and what is appropriate in a given situation. The success of these front stage performances depends on others co-operating and engaging in performance, being familiar with and following the same script (Goffman, 1956). What is done outside of public contexts is compared to the backstage play; this is where we are thought to be our true selves (Goffman, 1956). Goffman (1956) also discussed moments when the performance slips and we "give off" true selves in public. Following Goffman's (1956) analysis, Hochschild (1983) proposed two approaches to emotional labour: surface and deep acting. Later, other approaches have been added (Grandey and Melloy, 2017). In surface acting, people remain faithful to their true emotions, but act in accordance with social rules. In deep acting, they change their emotional responses and feelings associated with the situation in order to change their actions (Hochschild, 1983). Although it was believed that deep acting is more problematic as it can lead to a loss of true self, more recent work suggests that actually the mental effort required in surface acting, where one's own feelings are masked and other feelings "pasted in," is more taxing and detrimental to one's mental health (Gross et al., 2000, Richards and Gross, 2000). This shows that reappraisal and suppression of emotions requires more effort than genuine affects (Gross et al., 2000).

8.1.2 From emotions to body techniques

The concept of body techniques is useful in understanding the differences between practices linked with negotiating safety around dogs as it recognises their situated and socially structured nature. The concept also helps to connect the emotions and practices, by showing how emotions are embodied, i.e. experienced and shown through physically. Body techniques are units of action defined as "ways in which, from society to society, men [sic] know how to use their bodies" (Mauss, 1973, p. 97). For example, finger counting (expressing numbers with a hand) reflect different body techniques (Figure 8.1).

a) Japan

b) Germany, France, Spain

c) The US and the UK

Figure 8.1. *Finger counting as an example of different body techniques (Huang, 2016).*

Body techniques describe the physical motor functions, postures, and patterns of actions (Mauss, 1973). Body techniques are not unique to an individual as they are acquired through socialisation– in this sense they pre-exist and outlive individuals (Mauss, 1973). Body techniques have to be learnt, which distinguishes them from instinctive responses, but they can be reflexively practiced (Crossley, 2005). Body techniques are embodied and embodiment may limit the techniques used (Crossley, 2007). For instance, when learning how to swim, at the beginning poorly developed muscles and inability to replicate the correct technique makes butterfly stroke nearly impossible. Learning and maintaining body techniques can require mental effort, so they are also mindful activities (Crossley, 2007).

Goffman argued that body techniques are used to cope calmly with situations that may cause anxiety and possible danger, emphasising how risk management is not just a cognitive but also an embodied process (Goffman, 1956). The concept of body techniques also helps to track how response*ability* (i.e. ability to respond) (Brown and Dilley, 2012) is practiced. In this way, body techniques can be used as forensic tool for understanding how people manage risk around dogs.

8.2 Findings

Safety around dogs was experienced as a feeling or instinct, which informed body techniques. Negotiating safety was described as emotional labour- participants spoke of their ability to regulate emotions around dogs as crucial for safety. In particular, preventing emotional contagion or using it deliberately to affect dog's behaviour was identified as important. A range of situated (with respect to space) and embodied body techniques through which interactions with dogs are managed were described (see Figure 8.2. for a summary of the coding framework).

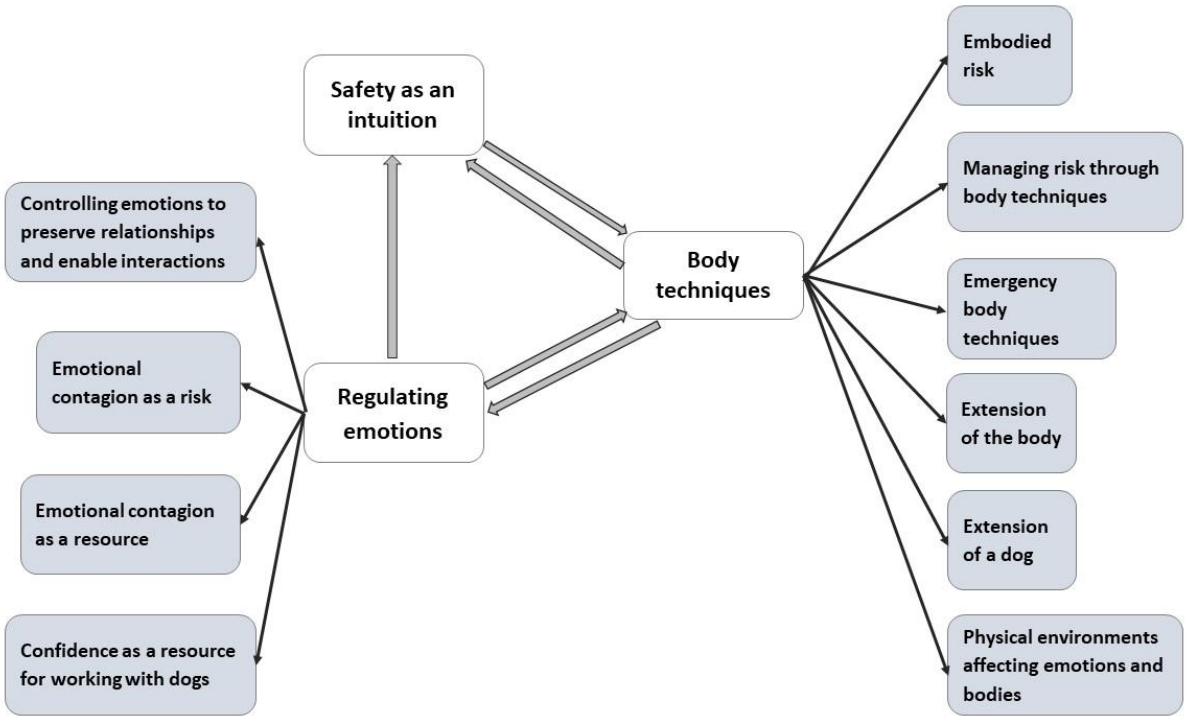


Figure 8.2. *Schematic representation of how emotions are regulated and used in management of risk around dogs. Safety is experienced intuitively, which shapes body techniques and affects practices around dogs. Intuition is shaped by how emotions are experienced, which can change due to emotional contagion (which can be a hindrance or a resource for risk management).*

8.2.1 Safety as an intuition

Safety around dogs was typically experienced as feelings or intuition rather than an outcome of rational and conscious assessment. For example, participants working in dog shelters described how they decided how to act:

"If you're in a kennel with a dog, and you can tell it's a little bit off, (…) you need to get out of that situation (…) it's going with your gut, your stomach's basically dropping because something bad is about to happen" Amy, Dog Shelter.

Amy was acting on her knowledge – which informed her that something was "a little bit off" but also on a feeling. Feelings of risk which shaped actions around dogs were also informed by prior experiences with a given dog:

"Sam explained that now dog fights are rare as they usually mix dogs that they already know quite well. When he mixes dogs he already has a "feel for a dog". I asked him what he means by it. He said that it's hard to describe, but you watch what the dog is like in the kennel, on the field, when passing other dogs, you look for "flashes of aggression", you observe the behaviour, pay attention to "other temperament issues" (like food guarding, general anxiety written in dog's notes) that could make a dog "more risky"". Fieldwork notes, Dog Shelter.

Developing the "feel for a dog" was therefore based on intuition, which Sam developed through working with many dogs over time. Even if the emotion-based decisions in a given moment were pre-reflective, the feel for the dog was pro-actively developed by watching dogs in different contexts and reading their formal assessments. In a different context, Ben also described how his risk assessment is structured around the formal work procedures (i.e. pro-actively developed), but ultimately, signs of dog's presence are often noticed subconsciously and the decision to enter a property is made based on how he feels:

"It takes (…) two seconds to walk into a property and a second (…) to post a letter. Within that time you take all that information in, (…): "Are there any signs? Are there any noises? Is there anything in the garden?" (…). Therefore you deem that in your mind to feel safe to go and post (…) You act on instinct. (…) It's a subconscious thing." Ben, Delivery Company.

8.2.2 Regulating emotions

Participants described noting and managing their own emotions as crucial to navigate safety in encounters with dogs.

8.2.2.1 *Controlling emotions to preserve relationships and enable interactions*

Participants expressed different needs for regulating emotional responses: it maintained a positive relationship with a dog; allowed a person to be able to continue to work with dogs, and; enabled preservation of an identity as a dog lover. For example, Luke explained how he consciously strived to control his emotions to maintain a positive relationship with dogs, after being bitten:

"I've been very conscious of trying not to let it [change my perception of dogs], but yes, it has. (…). Just to be honest, for about a week afterwards, I think I saw two dogs, and I was a little bit nervous, and I hated myself for being nervous, because as I said, I have a natural affinity for dogs. I didn't feel that I was scared enough, or intimidated enough to need to cross the road, but equally I didn't want to do it either. So I forced myself for that week to continue running as I had always done, because I wouldn't have crossed the road if I saw a dog coming before that had happened" Luke, dog owner, bite victim.

Luke described regulating fear and apprehension by adhering to routine practice despite feeling uncomfortable about it, as a way of maintaining his identity, sustaining a treasured relationship with dogs and continuing to enjoy running. In dog shelters, participants frequently drew on emotional labour to enable them to work with dogs that they feared. Kate explained how she worked with fear in order to carry on working with a dog after she was bitten:

"*Yes, I was quite conscious not to be (…) scared of him. So, I made an effort, once he'd calmed down in the afternoon, I made sure I was the one to go and get him out and exercise him, and just took him for a walk"*. Kate, Dog Shelter, bite victim.

8.2.2.2 *Emotional contagion as a risk*

Participants described a range of emotions as being contagious among people and between people and dogs. This aspect of emotions was seen as a source of risk – when emotions were not controlled – and a resource, when participants were able to use this property to influence others or dogs. For instance, explained how her fear of dogs, which she felt was something she could not control, put her at risk:

"The minute it barks, that's it. Everything is gone. Just fight or flight, flight. (…) But because I'm like that, I get more worried. Because I think, if I run off, I know one [dog] would come after. It would chase me. (…) Then if I'm there, I'm thinking, "It knows I'm frightened," so then I'm even more frightened" Ella, Delivery Company.

Ella believed that she is at risk of bites because dogs sense her fear and as a result, are more likely to attack her. The above quote also shows how Ella's interactions with dogs (running off) was shaped by feelings. Melissa explained why her dog bit two men in similar terms by linking a bite with emotional contagion:

"Those two men didn't like dogs. So, whether they were nervous already and Fluff, that was the dog's name, could pick up on it, possibly, I don't know. Obviously, they're really good at picking up on anxiety. (...) But, the postman and Dom, they're stiff in their movements, they may be a bit jerky, so I don't know whether that triggered… So Fluff was like, "Oh, they're anxious. Maybe I should be anxious. Maybe they're up to something or maybe they shouldn't be here. I should bite them to make them go away." Melissa, owner of a biting dog.

Mellissa speculated that the emotional contagion could be direct or a result of body techniques, indicating how the two are hard to separate.

Emotional contagion was also observed between dogs, posing a risk to participants in case it resulted in a dog fights that participants needed to split. In this case some participants described walking their dogs individually and separating them ahead of situations in which they anticipated their behaviour to deteriorate (e.g. morning delivery of post).

8.2.2.3 *Emotional contagion as a resource*

Participants identified remaining calm, and body techniques which helped to project the sense of calmness and confidence, as a way of using emotional contagion to their advantage. For example, Anna described how she regulates her emotions and appropriate body techniques (smile) to prevent an adverse reaction from the dog:

"I stay quiet and pretend I'm not afraid. And if the dog is approaching, I smile. Just smile. Just pretend. It works! (…) dogs can smell the fear". Anna, owner of a biting dog, bite victim.

Chris also talked about projecting calmness to affect behavior of dogs and described adapting his body techniques accordingly:

"I've read that if you're less animated, and you ignore the dog, the more likely the dog is to calm down. So that's what I do". Chris, Delivery Company.

Using emotional contagion to manage risk was also incorporated into staff training in one of the dog shelters:

"Nicki explains the importance of calm handling in managing stress of dogs in the shelter. She shows what she means by it: she's stroking Peaches slowly and really gently, the dog is getting excited even with a very gentle tactile contact and when she does, Nicki gives Peaches a break. She's using calm, low pitched voice and she's speaking slowly: "Ok girl, good girl". Nicki explains that this handling can change the physiology of a dog, get the endorphins flowing, and change their behaviour" Fieldwork notes, Dog Shelter.

Emotional labour was therefore seen as needed to develop appropriate body techniques which helped projecting the correct emotions. Remaining calm was described as important to prevent bites but also to reduce the impact of an ongoing attack, as Beatrice reflected:

"At some point I think I calmed down and (…) somewhere in the corner of my mind... I was like 'Oh wait! Maybe the fact that I'm screaming... and going crazy... is making the dog stay attached to my face' So I think I calmed down and he let go." Beatrice, bite victim.

8.2.2.4 *Confidence as a resource for working with dogs*

Confidence in particular was seen as an emotion which needed to be carefully managed as both lack of confidence and over-confidence were believed to be dangerous, by impacting on body techniques, as illustrated below. Being bitten, experiencing a near miss or even seeing a bite was discussed as challenging individual confidence around dogs. Here Anne describes how intervening in a bite affected her:

"Obviously we were the first ones [at the scene]. The initial day afterwards, it took a knock, especially on me, but a couple of days after that it was gone and I was absolutely fine. I just put myself back in the situation again, walking the dogs. I was a bit unsure, going back in the next day" Anne, Dog Shelter.

Confidence was thought to translate to body techniques and therefore it was needed to interact with dogs safely but also to seek help. For instance, Melisa scrutinised how confident she was in order to decide if she could accept the risk associated with behaviour of her dog:

"I thought that it was definitely something that we could manage and work on, and that I could get help if needed to address it. I didn't think it was severe enough… You know, it wasn't like he went into a wild rage and he was going to bite anybody" Melisa, owner of a biting dog.

Holly, who works with dogs professionally, also discussed developing her own confidence in order to work with a dog:

"Holly told me that when she saw Patch (a large mix-breed dog) for the first time, he was on one of his "bad days", so she saw him from his worse side. It took her time to build up confidence to work alone with him, she relied on [help of more experienced colleagues before]". Fieldwork notes, Dog Shelter.

Holly's account also shows the importance of relying on others (her colleagues) to develop confidence and be able to act on it. Adam also described the importance of being able to act in a confident manner (i.e. outwardly portray the feeling of confidence), as a resource during an encounter with a potentially dangerous dog:

"It's got me out of a few scraps. (…) I find, if you've got a dog coming at you, if you're confident just shout, "Down" at the dog. Just repeat the word 'down', it seems to at least confuse the dog. "Hang on this bloke is not scared of me, he's not running away. Maybe I'm in the wrong here." That seems to work". Adam, Delivery Company.

How confidence was translated into body techniques had to be carefully managed: insufficient confidence made it hard to engage with dogs; excessive confidence was also seen as a risk. Participants worried that staff who lacked confidence may try to prove themselves and get injured as a result. Being able to admit lack of confidence and to seek help was seen as equally important aspect of safety:

"It's better to over-report than under-report and just being confident to do that, which I think we try and make everybody confident in their ability to report stuff rather than confident in, "I'm the best dog handler. I'm never going to get bitten." It's better to say, "I'm not sure about this. I'm going to ask somebody else." Focus Group Discussion, Isabel, Dog Shelter.

8.2.3 Body techniques

Appropriate emotions were performed around dogs through body techniques. Body techniques were shaped by the physical characteristics embodied by the individual. As interactions with dogs occur in various, often confined spaces, body techniques were shaped by the physical environment and extended by use of equipment. Dogs themselves were also manipulated.

8.2.3.1 *Embodied risk*

Participants described how individual's embodied qualities shaped interactions with dogs and risk. Perceptions of risk around dogs were also assessed through the prism of embodiment. For instance, John (Delivery Company 2) described reporting a person to the police because he was concerned over her safety. He thought that *"a single woman living there with her daughter and her granddaughter" "couldn't control the dogs".* This illustrates how the assessment of what constitutes risk depended on the perception of an individual's characteristics. Pat also discussed how her knowledge of dog behaviour and resultant

techniques for managing her dogs were scrutinized and deemed insufficient as a result of her age and gender:

"Pat: I was being made to feel bad for having dogs and made to feel like I didn't know what I was doing. Because as a young single female what the hell do I know about dogs? Do you know what I mean? It's like, "But I know loads."

Interviewer: Do you feel like people were questioning you because of that?

*Pat: Yes, definitely. Older people. Men. Men of any age above mine (…) F**k patriarchy [laughs]"* Pat, owner of a biting dog.

Interestingly, participants who worked with dogs professionally often thought that the opposite was true: they thought that men who work with dogs professionally are less able to control dogs and more likely to provoke a bite:

"*Some of our vets, the male vets, are really worried by dogs. They really don't want to touch dogs. They will always stand back and they always make sure you've got a tight restraint and are really like, "Have you got them? Put the muzzle on. Do this, do that." Whereas I find the female vets are a lot more relaxed about it. And I don't think they get bitten more*" Richard, Dog Shelter.

Professionals working with dogs believed that men provoke bites as they interact with dogs differently than women do and often commented on men being reluctant to follow advice. Dog shelter workers commented on how men tend to be more violent towards dogs and use more aversive handling techniques. Consequently, dogs were believed to respond differently to all men, as they generalize the negative experiences with some of them. For example, a female participant said:

"I've come across a lot of men who use probably negative reinforcement with the dogs. (…) It depends on, say if their old owner maybe looked a bit like me maybe and they've had a bad experience, it could trigger that as well" Davie, Dog Shelter.

Further, embodied characteristics shaped the perception of risk around dogs but also the actual practices people used around dogs. For instance, Philip explained reasons for his wife walking their dogs separately:

"She's actually, physically, not very strong. Walking two dogs was just more than she could handle" Philip, owner of a biting dog.

8.2.3.2 *Managing risk through body techniques*

Participants agreed on the importance of not threatening a dog, but they expressed different ideas regarding body techniques that can be used to show it. For instance, Philip described a perceived good technique as follows:

"Things like don't loom over them and this kind of thing. (…) I did learn ages ago not to smile at dogs too much, because I think it comes across as baring one's teeth." Philip, bite victim.

By contrast, Anne, quoted earlier, believed that she could appear non-threatening to a dog by smiling. In addition, Adam spoke about confidence projected by standing tall and not giving in to a dog, which could easily mean looming over and being threatening.

Within professional contexts, developing body techniques was based on close surveillance of dog's body language and understanding of what dogs were signaling, i.e. being able to empathize with dogs and anticipate their behavioural responses. Most dog professionals agreed that approaching dog sideways and giving them space helped to negotiate safety:

"Just things like not necessarily going face-on, so sat, kind of, just in front of him, but not staring at him. It's just more of a relaxed posture, trying to be sat at the side and then I wasn't sat "on him", cuddling him or anything like that" Isabel, Dog Shelter.

As body techniques were a way in which emotions were expressed and were closely linked with emotional regulation, knowledge of what one should do was not enough to execute it. Being able to regulate emotions (and express them appropriately) was perceived as a necessary first step, as Adam described:

“I don't know whether I'm brave enough to try not making eye-contact. I've heard, "Turn to the side of a dog and present a less… a non-threatening profile”, but I don't know if I'm brave enough to do that.” Adam, Delivery Company.

Body techniques often involved an iterative interaction between dog and human bodies:

“Jessy approaches Vinnie, an English bulldog slowly: she comes towards him sideways, chats to him in a high pitch voice, narrating his emotions and behaviours and commenting on his medical condition: “You’re buggered, you’re completely decrepit mate… Oh sweetie, you’re a bit unsure”. “It’s the water [kennel floor is a bit wet]”- she explains to me. The dog approaches her and backs away repeatedly. His body is slouched and it looks as if his balance is centred on his hind legs. He licks his lips. I’m wondering how Jessy is reading him as he’s so inbred that it’s hard to notice any changes in his facial expression. She incites him to approach her with a selection of cheeses and chicken, being careful not to lean over him as she’s stretching out her hand.

He finally approaches. His body appears loose, he doesn’t have a proper tail but his whole bum is wagging, his snorty breaths are louder. In the same time he is still nervous – he lifts his paws frequently and ducks away when she tries to touch him. Jessy explains that she wanted to put a harness on him because he’s a bulldog and therefore, he is struggling to breathe, but she’s not going to because she wants to give him space” Fieldwork notes, Dog Shelter.

Jessy’s behaviour was dependent on the behaviour of the dog – her actions were unfolding to match his behaviour, as she was interpreting his behaviour and his emotions in real time. Her subsequent body techniques were shaped by her previous techniques as well as emotions, showing that the relationship between body techniques and emotions was bi-directional. She was mindful of the movement and the speed of her body and how the kennel environment is contributing to their interaction. She was relying on multiple senses to change his behaviour from avoidance to approach; her voice, scent (cheese/chicken) and movement. Crucially, change in Vinnie behaviour was attributed to him experiencing different emotions; becoming more relaxed and at ease.

Safe body techniques often depended on co-operation with colleague; it required synchronizing with a person as well as a dog:

"Me and Molly will go in together so there is two of us so that we can restrain them, or one will hold the lead whilst the other one puts the muzzle on, or one will be putting the harness on while the other will watch the dog in case his behaviour changes" Anne, Dog Shelter.

More generally, the pace of body techniques (matching the movement with dog's and not rushing) was seen as crucial aspect of good body techniques. For instance, here Jim describes not rushing a dog to be ready for a medical examination, even if it means a dog will not be examined:

"We don't necessarily muzzle them and force them to have a look. If it's not too bad, we send them back out to the block and then get the [training team] to put an ear desensitisation programme into them [a training programme which teaches a dog to accept having their ears manipulated]. (…) Then we would just go into the [vet] room, feed the dog, take him back out, go back in, feed the dog, and then eventually, you would maybe touch his ears or just touch him. Maybe then slowly introduce a stethoscope (…), and then probably introduce the vet or the vet nurses slowly. Then finally, the vet repeating those sorts of steps." Jim, Dog Shelter.

Sometimes, to avoid putting pressure on a dog, quick handling was necessary:

"Good handling is often quick, no faffing. This sometimes means not putting a harness on a dog, just quickly clipping a lead, not trying to make friends in kennel but just getting them out, into an open space, where it's easier" Richard, Dog Shelter.

The decision to move the dog quickly was based on understanding how the kennel environment affects dogs and how body techniques need to be adapted in response to knowing that a dog is likely to be stressed in the kennel. Overall, while the participants in some shelters tried to take dogs out of kennels quickly, often on a slip lead, in other shelters, participants argued that building a relationship with a dog in the kennel first, ahead of taking them out, was a safer approach. This illustrates how body techniques were shaped by social norms.

8.2.3.3 *Emergency body techniques*

Dog professionals described separate body techniques used in emergencies which can reduce the damage at the point of a bite. They often discussed thinking of barriers which could ease the impact of a bite or trying to put something into dog's mouth to open it:

"When there is a fight, you can try to stick something into dog's mouth to make them gag, a pry stick or tap it out (choke slightly until dog releases). I'd also hold a dog between legs, try to stabilise the situation first and mainly make sure the dog won't re-attach." Gregg, fieldwork notes, Dog Shelter.

Tom listed techniques required to prevent damage during an ongoing attack:

"Worse thing you can do [when being attacked] is to allow the dog to go up. You need to do whatever you can to keep the dog away from your face and neck, do what you can to stay up" Tom, fieldwork notes, Dog Shelter.

By comparison, lay dog owners rarely considered these situations, believed that that just calming down helped to break up the attack (as seen in an earlier comment made by Beatrice).

8.2.3.4 *Extension of the body*

Body techniques were also extended through use of equipment which helped to manage dogs, defend from a bite or minimize its damage. Emergency techniques which required placing something in dog's mouth relied on this approach. In addition, below Anna explains how she handled her dog's teething phase by using a barrier:

"They are little sharks and not dogs, because at this age they like to bite. And I started to walk inside my own house in wellies" Anna, dog owner bite victim.

Others discussed the role of clothing as a barrier that mitigated the impact of a bite at work. In this context, long trousers, thick jackets and socks were often mentioned:

"I've always got trousers on. I had brand-new socks on that day. I do wonder what happened, if I had shorts on with no socks or short socks? It might have been worse." Dan, bite victim, Delivery Company.

A number of staff in one of the delivery companies commented on the use of folded plastic devices which helped to spare their fingers, if a dog bit the letters posted through the letterbox using them. The promotional material which encouraged their use also drew on the body extension metaphor, showing how a hand can be extended by 5 devices which could save fingers.

People who worked with dogs discussed ideas for using improvised barriers (satchels or delivery trolleys) to defend an attack, again showing how body extension are used as an emergency technique. For example, Clair commented on how a body can be further modified for safety with use of pig-boards:

"She actually gave me some advice - to use a pig-board. So a big board with handles on. So you can actually block a dog from coming at you. (…) And they have been really useful. They've been used several times". Clair, bite victim.

Dog shelters differed with respect to how the equipment used as body extension which could help to minimize damage during dog attack was used. In some shelters, "dog graspers" or "long arms" which enabled securing a dog in an emergency without approaching them and dog bite sticks, i.e. the equipment used to pry a dog's jaws open, were seen as crucial for safety. Participants from other shelters thought they were only there to fulfill health and safety regulations and could not recall a time when this equipment was used. This again shows how body techniques are developed socially.

Tools were also used to work on dogs' bodies and to change dog's affective disposition, increasing safety of staff outside of emergency situations. In one shelter, various toys were used in this way during training:

"She shows how a hoop with a handle helps dogs to think about what they are doing as they have to re-adjust the grip. She explains how toys designed in a way that a dog can only bite

one part can help to work with dogs that rag on leads and try to grab clothes when stressed. It teaches them impulse control" Fieldwork notes, Dog Shelter.

In this case, toys are used as an extension of the body, not to reduce the impact of a bite, but to help to change dog's behaviour.

Putting dog on the lead was also seen as an extension of the (owner's) body that provided safety:

"I was just running in the local park. People always have their dogs off the leads, it's a risk (…) If you want to be in a shared space, put your dog on the lead. I don't think it's that difficult, and I don't understand why dog owners find that such a repellent idea." Alice, bite victim.

8.2.3.5 *Extension of a dog*

In addition to extending human bodies to make them better equipped for a bite, dog bodies were also modified. An obvious barrier used in dog shelters and by dog owners were muzzles. Shelters and dog owners did not routinely muzzle dogs; dogs were muzzled only for certain procedures if an adverse response was expected. For instance, Melissa described using a muzzle with her dog as an additional reassurance in high-risk situation:

"If you're going to have to go into a situation where you think something may occur or if there's a potential, definitely muzzling". Melissa, owner of a biting dog.

In addition, some shelters described regularly sedating dogs ahead of procedures to manage their behaviour, and other shelters described use of anxiolytic medications to help with management of and improvement of behaviour of individual dogs in kennels. Participants from all shelters and some dog owners also discussed attaching a short lead to a dog, which literally extended a dog making it possible to manage them without approaching too closely.

8.2.3.6 *Physical environments affecting emotions and bodies*

Confined spaces were seen as a source of risk because of how they affected dogs' emotions. Staff who worked in dog shelters and vet practices discussed how narrow corridors and

pathways put them at risk as dogs are more likely to re-direct a bite aimed at another dog onto a person. The novelty, sound and smell of shelter environment and vet practices were also seen as contributing to animal stress, making them more anxious and likely to attack – as Jessy said, "*it's the environment that works against you*". Participants who did not work with dogs professionally also observed this about space:

"Carol: Yes, he was strung up. He was worried, I think. We were spending a night in the campervan.

John: It was a new place, a different place.

Carol: (…) I feel the constricted space is bad (…)" Carol and John, owners of a biting dog, bite victims.

Confined spaces also restricted body techniques which could be used to manage them.

"Matthew: (…) We went to a pub and we sat down. We were on benches like this (…) I'm always very conscious in some places of these types of seats. (…) they're not great if you need to jump out quick. (…) You're stuck, aren't you?" Matthew, father of a son bitten by a dog.

Matthew thought that the dog reacted to his son, Ian, because he was cornered under the table. They believed that Ian was bitten because Matthew could not prevent the bite quickly enough.

Use of body techniques which opened up the space were seen as promoting safety:

"I did give it some room, I slowed my pace a little bit, went to move around him, and probably gave the dog six feet of room maybe. In hindsight, I would have probably have given it a little bit more room." Luke, dog owner, bite victim.

8.3 Discussion

In the previous Chapter, I discussed the role of trust as an "in-between" strategy for identifying and managing risk in interactions with dogs (Zinn, 2008). Here I focus on how emotions and intuition were used for the same purpose. Risk around dogs was sensed as a

feeling. Participants expressed a need to manage their emotions to avoid contagion of unhelpful emotions and to use helpful emotions to influence dogs. In practice, safety in interactions with dogs was negotiated through body techniques. Body techniques relied on an orchestration of movement between people and between a person and a dog. Body techniques were informed by feelings as well as social norms, behaviour of a dog, individual's knowledge and abilities as well as situated and embodied context of interactions.

8.3.1 Assessing and managing risk in dogs through emotions

The body techniques around dogs were influenced by feelings. In particular, fear influenced perception of risk and interactions with dogs, as the affect heuristic hypothesis predicts (Finucane et al., 2000a). Feelings around dogs and body techniques they informed were not just pre-reflexive responses. Instead, they were shaped by prior experiences with dogs; dog's performance; knowledge of their character; broader knowledge of dog behaviour, the environment within which the interactions were taking place; procedures and one's embodied characteristics. Emotions were also influenced by body techniques that were already performed; e.g. seeing change in dog's behaviour as a result of a particular approach put participants at ease, which led to further changes in body techniques. Within work, participants also strove to pro-actively develop feelings which informed their risk assessments. For instance, they looked for dog behaviours and formal notes on a dog that could give them "a feel for the dog".

Participants stressed the importance of not questioning these sensations and acting on them – they prioritised intuitive knowledge over other sources of information. A similar strategy was employed by parents of children with autism who explained the importance of "staying close to your gut feeling" in order to pre-empt the behaviour of their children and ensure their safety (Woodgate et al., 2008, p. 1080). These sensations therefore reflect intuitive understanding of dogs. Intuition helps to recognise risk patterns rapidly and respond to them, before the risk is consciously recognised (Salas et al., 2010). Participants developed intuition for risk in the course of repetitive interactions with an individual dog (in the case of dog owners) or in course of interacting with many dogs and formal learning (in case of those who work with them). Intuition-based decision making is effective, particularly when based on a breadth of interactions over time, and deliberate practice, as may be the case with dog

professionals (Salas et al. 2010). As owners' intuition is more likely to be developed in course of interactions with a single dog, it may not be as accurate in identifying risk in other dogs, potentially creating a false sense of safety.

8.3.2 Body techniques for safety

Body techniques acted as a mediator helping to transform the effect of emotions into action. Confidence and re-assurance from body techniques also shaped the underlying emotions, illustrating the link between affect and action. Body techniques were how the emotional labour required for safety was carried out. The importance of an ability to manage one's body also shows the material and performative aspect of negotiating safety. Ability to act has been discussed as a crucial part of being a response-able dog owner (Brown and Dilley, 2012); it is also essential for being safe around dogs.

Appearing non-threatening to the dog was discussed by all as an important body technique; this involved approaching dog sideways and avoiding eye contact. Participants who worked in dog shelters also emphasised not rushing, not "faffing", and giving dog time and space within this context as well as using food to encourage a dog to approach the person. These body techniques reflect a perception that dangerous behaviour of dogs is primarily a result of fear or over-excitement. Body techniques were also shaped in response to social norms, for instance different shelters had different approaches to training and use of equipment. Perceptions of safe body techniques differed between lay dog owners and experts who worked with dogs. Participants who professionally work with dogs described a greater number of behaviours to watch out for in a dog and listed a number of emergency techniques. Participants working in the delivery sectors and lay dog owners also did not agree on what was safe technique (e.g. they were not sure if a smile would appease a dog or threaten them).

Body techniques were used to transform both the behaviour of a person and that of a dog, by affecting their emotions and thus facilitated emotional contagion. In this sense, body techniques were transformative – they affected both subjects. The transformative aspect of human-animal interactions (where both subjects are changes as a result of an interaction or relationships), has been previously discussed within the context of between-species communication (Haraway, 2008, McVey, 2017). Haraway described relationships with dogs

(2008, p. 175) as 'partnerships-in-the-making', i.e. relations based on interactions between a specific person and an animal within a specific context, which shapes both subjects and enables communication. Here, this specificity was seen as, for instance, body techniques that were adapted to the particular dog (e.g. Vinnie who could not breathe), and space (e.g. recognising how a kennel environment may affect the interaction) and a person (e.g. recognising that one is not strong enough to walk two dogs at the same time, so walking only one).

Previous research highlighted how company of dogs influences experience of physical space (Leffler et al., 1996). Conversely, perception of the environment also influences how dogs are managed: where owners see the environment as 'wild' and 'natural', they pay dogs less attention and are more likely to have them off lead (Brown, 2015). Environment was described as an important factors shaping communication – and thus safety- when horse riding and some spaces were discussed as making communication difficult as they affected emotions of the rider and the horse (McVey, 2017). Here physical environment was described as promoting and restricting body techniques by influencing the emotions of dogs and people. Open space was generally experienced as safe, while confined spaces "worked against you". In addition, body techniques relied on body extensions and modifying dogs through the use of physical equipment. Managing risk required more than individual will; it built on co-ordination of a network of material 'mediators' or 'actors' (Latour, 2005, p. 39) – plastic posting devices, various barriers, clothing, the physical environment where the interactions were taking place, dog muzzles, leads and so on.

8.3.3 Regulating emotions and emotional contagion

Emotional contagion was a source of risk when unhelpful emotions were passed to dogs but it was also used as a resource to influence the behaviour of dogs. Consequently, participants discussed an ability to regulate emotions- in particular maintaining confidence, suppressing fear and cultivating calmness - as crucial for safety. A mind-body connection and emotional transmission was previously explored within the context of managing safety when horse riding (McVey, 2017). Riders believed that their psychological state impacted on their ability to communicate with the horse and subsequently, safety (McVey, 2017).

Emotions and emotional contagion were regulated and managed primarily by surface acting (Goffman, 1956); the actual emotions that participants sensed did sometimes change over time, as a result of consistent practice (for instance, if confidence built). Shelter workers in particular, described that after some time when working with a challenging dog, surface acting gave way to deep acting - the fear of dogs became manageable or disappeared and their body techniques were motivated by genuine feelings and became more intuitive. In this context the distinction between surface and deep was temporary rather than permanent. Typically, participants performed confidence or calmness around dogs while feeling anxious or fearful, hoping the performance would have the same impact on dogs as genuine feeling. Therefore, negotiating safety around dogs required emotional labour and emotional management (Hochschild, 1983). Emotional labour was also drawn on to maintain identity of a dog lover and enable working with dogs when one lost confidence.

It has previously been suggested that the training regime offered by the TV dog training guru, César Millán, aims not so much to change the behaviour of the dog, but to discipline what is depicted as out of control emotions of the owners (Wlodarczyk, 2018). Within Millán's training regime, the root of all behaviour problems of the dog is lack of "calm, assertive energy" of the owner and the owner's excessive emotionality and affection towards the dog (Wlodarczyk, 2018). A similar view was shared by YouTube viewers (Chapter 4), who believed that dog owner's personality, and in particular, inability to control emotions, caused dogs to bite. Here the problem was described in broader terms, as an inability to suppress emotions but also to express the appropriate ones. Risk in interactions with dogs was explained in terms of not following the 'feeling rules' (i.e. cultural rules regarding appropriate intensity, length and target of emotions) and 'display rules' (i.e. how the emotions should be correctly shown (Hochschild, 1990)). Scripts that dictate 'feeling' and 'display' rules are culture-specific and change as cultures evolve (Turner and Stets, 2005, p.36). Use of different body techniques around dogs could therefore be explained in terms of different knowledge that motivated participants' body techniques, but also in terms of different cultural views regarding how to, e.g., present oneself as friendly and confident to dogs.

8.3.4 Implications and recommendations for improving bite prevention

Empirical research suggests that human emotions are indeed contagious to dogs (Yong and

Ruffman, 2014); dogs respond to human facial expressions and behaviours, and recognise emotions (Deputte and Doll, 2011, Müller et al., 2015, Albuquerque et al., 2016), which can affect their emotions. In addition, participants described emotional regulation as central to their safety and confidence around dogs. For both of these reasons, techniques which improve emotional regulation could be considered as helpful in bite prevention. Although this approach has not been formally evaluated, it is increasingly more popular aspect of safe horsemanship (Foli, 2015, Kovatch, 2019, Senior, NA) and given a number of parallels between management of safety when horse riding and interacting with dogs, it could be used in this context. Indeed, a concept of dogmanship (a parallel to horsemanship) has been developed to describe individual skills needed for interactions with their dog, including training, and overall quality of a relationship (Payne and McGreevy, ND). Reflecting on how one interacts with a dog (i.e. reflective practice), and the role of owner's emotional intelligence (i.e. "the ability to recognize and respond to emotions of other people" have been suggested as crucial facets of dogmanship (Payne and McGreevy, ND, p. 5). Mindfulness training which helps one to become more aware of ones' emotional response could be used in this context (Hill and Updegraff, 2012).

As body techniques were seen as crucial for safety, bite prevention should be centred on teaching practical skills around dogs and general body-awareness in human-dog interactions. Training owners how to use their bodies and material objects to manage their dogs better (e.g. how to teach a dog using treats, how to use toys, or even how to walk dogs and re-call them when needed), could be more helpful than factual knowledge of dog behavior and body language. Bite prevention initiatives should also carefully consider the physical environment aspect of bite prevention; preventing bites in densely built and highly populated areas may be harder than in the countryside. Environments could be better designed to promote safe interactions with dogs. In financially deprived areas, access to helpful material "mediators" of safety with dogs, or appropriate physical spaces, may also be more restricted (for example dogs restricted by small houses and yards).

Further methods of developing intuitive decision making while working with dogs could be explored. Deliberate and guided practice which improves intuition (Salas et al. 2010) could be incorporated into training of people who work with dogs or encounter dogs at work. This could include professionals to keep diaries of their interactions with dogs, key learning and

ideas for future development. In addition, providing staff with regular feedback on their learning and practice and developing an environment where this feedback is sought after, e.g. through a mentoring system or regular supervision meetings (Salas et al., 2010) could also be helpful. An awareness campaign which helps lay dog owners understand that their intuition may be limited (as it is based on interactions with limited dogs, which may not translate to other dogs) is also warranted.

Recognising management of risk in interactions with dogs as emotional labour has several implications. Some forms of emotional labour could lead to a professional burnout (Brotheridge and Grandey, 2002), e.g. compassion fatigue has been previously recognised as a risk to shelter workers (Rank et al., 2009). Equally, delivery staff and people who are fearful of dogs but encounter them may also experience frustration and burnout. Organisations could implement formal strategies to mitigate this by, for instance, fostering peer support, encouraging further on job training and providing mental resilience training to their employees, which has been effective in other work contexts (Taormina and Law, 2000).

Here, confidence to seek help was recognised as a part of organisational safety culture at work and feeling a need to prove oneself due to lack of confidence was seen as a source of risk. This further illustrates that practices related to managing risk in interactions with dogs, at work and in other contexts, are shaped in the course of social interactions and in response to social norms. Dog bite prevention initiatives could harness this by identifying role models who could promote safe practices (e.g. installing baby gates, teaching dogs recall, seeking help) either locally, within a community or publicly, e.g. by creating a social media campaign which uses influencers to highlight safe practices.

8.4 Conclusion

In this chapter the importance of emotions in identifying risk posed by dogs and responding to it was discussed. Emotion and intuition-based approaches were not pre-reflexive responses to dogs, but socialized, embodied and situated reactions. These socialized emotions shaped body techniques around dogs and were in turn shaped by them. Negotiating safety required skillful co-ordination of a network of actors: individuals' own body, other people, dogs, but also inanimate objects used for dog management and protection from dogs, and the physical

environment. This illustrates a problem in seeing dog safety as purely individual responsibility or as dependent on individual skills. Acting safely around dogs required others, which reinforces the previously introduced idea of safety as a social process. Dog bite prevention programmes could be improved by recognising the materiality of human-dog interactions and how the physical environment as well as equipment that a person can access may shape their risk and ability to negotiate it. Bite prevention possibly could also be strengthened by harnessing the way social norms and relations shape practices around dogs. It is often believed that education into dogs' body language is the key to dog bite prevention, however, as discussed in Chapter 7, responsible dog ownership requires being response-*abl*e (Brown and Dilley, 2012), i.e. being physically able to act in an appropriate manner. Safety also requires this form of response-ability to execute whatever is considered safe in a given context. Prevention focused on improving individual's physical abilities could therefore be more effective than the emphasis on teaching regarding dog's body language.

9 "There's always more than one victim in a dog attack": The impact of dog bites on victims and implications for managing the severity of injury that dog bites cause

9.1 Introduction

The physical impact of dog bites is a common research subject (Mair et al., 2019, Lee et al., 2019, Morzycki et al., 2018). By contrast, long term consequences of bites, impact of bites on mental health and general wellbeing, impact of bites which did not result in hospital admissions, and their impact on witnesses, families of victim and owners of dogs that have bitten, are poorly understood. Consequently, bite prevention is limited to a set of practices which can be implemented to reduce the likelihood of a dog bite occurring. Initiatives which could reduce the broader impact of dog bites are rare. Measures can be implemented after an incident has occurred to alleviate their impact on the victim and others (Haddon Jr, 1980). Using participants' experiences of dog bites, in this Chapter I will suggest how dog bite prevention could be extended to injury reduction.

9.1.1 Preventing injuries or accidents

Impact of injuries can be seen as an outcome of frequency of a given injury and its severity. Injuries can therefore be prevented before, during or after an event (Haddon Jr, 1973, Haddon Jr, 1970), as detailed in Chapter 5. The mechanism driving reduction in the severity of injuries and their frequency can be independent and reliant on different interventions (Manuele, 2008). For instance, severity of injuries linked with contact sports has reduced dramatically in the last 30 years due to enforcement of protective equipment, without the number of sport injuries decreasing significantly (Hemenway, 2009). This suggests that both approaches could be beneficial to health and wellbeing (Manuele, 2008).

As outlined in Chapter 5 and 6, employers focused largely on dog bite prevention through measures implemented before and during the bite. Post-bite interventions included primarily reporting, investigating and learning from bites (Chapter 5). Measures that could reduce

injury to an individual (such as counselling or rehabilitation) were rare (Chapter 5). Outside of work contexts, safety around dogs is enforced through the Dangerous Dogs Act (1991) (DDA) and education. Hypothetically, the DDA may be interpreted as reducing the impact of injury by focusing on large-size breeds. However, given that majority of large breeds are not included in this legislation and that since its introduction the number or severity of bites did not changed, it could be argued that one of the existing measures is effective in reducing the impact of injuries which have already occurred. In addition further strategies for post-bite injury reduction should be explored as some bites may not be preventable.

9.1.2 Impact of bites

Lacerations to wrists and hands are the most common injury recorded in hospital records by dogs and plastic surgery is the most frequent reason for hospital admission among adults (Cornelissen and Hopster, 2010, Pfortmueller et al., 2013). In hospital records, the most common injury to children is an open wound of head and the most popular treatment is oral or maxilla facial surgery (Lackmann et al., 1992, Schalamon et al., 2006, Touré et al., 2015). This pattern of injuries to children could emerge because during interactions with dogs children often put their faces close to dogs muzzles (Lakestani, 2007) and because of children's height, a dog may reach their faces easier than other body parts. Caregivers may also be more likely to taken a child to the hospital after a bite to the face than to other body parts.

Both adults and children reported fear of dogs after being bitten (Shen et al., 2014) and nearly half of children were observed to show at least some symptoms of post-traumatic stress disorder or other psychological problems a year after a bite (Rusch et al., 2000, Hersant et al., 2012). The psychological impact of bites on adults has not been explored in great depth. However, a qualitative study with 8 female bite victims showed that after a bite victims reported: feeling guilty for not preventing it; feeling ashamed and embarrassed, particularly if bitten by their own dog; feeling angry and betrayed; believing that owners of dogs or the police did not respond adequately; experiencing stressful interactions with others involved; and feeling betrayed by a dog they trusted (Westgarth and Watkins, 2018). All of these experiences are likely to have a negative impact on individual wellbeing and mental health. In addition, parents of bitten children experience guilt and a sense of helplessness after an

injury to their child (Boat, 2019), showing that bites can affect the observers as well. This chapter will build on these themes and explore them in more detail, including in relation to different populations, those who work with dogs professionally and owners of dogs that have bitten.

9.2 Findings

Impact of bites (on physical and psychological wellbeing and social relations) is described first to contextualise coping mechanisms, outlined later. Impact of bites is modulated through coping mechanisms, which include return to work policies, having agency to decide on the outcome, reliance on social relations and seeking justice. Themes are summarised in Figure 9.1.

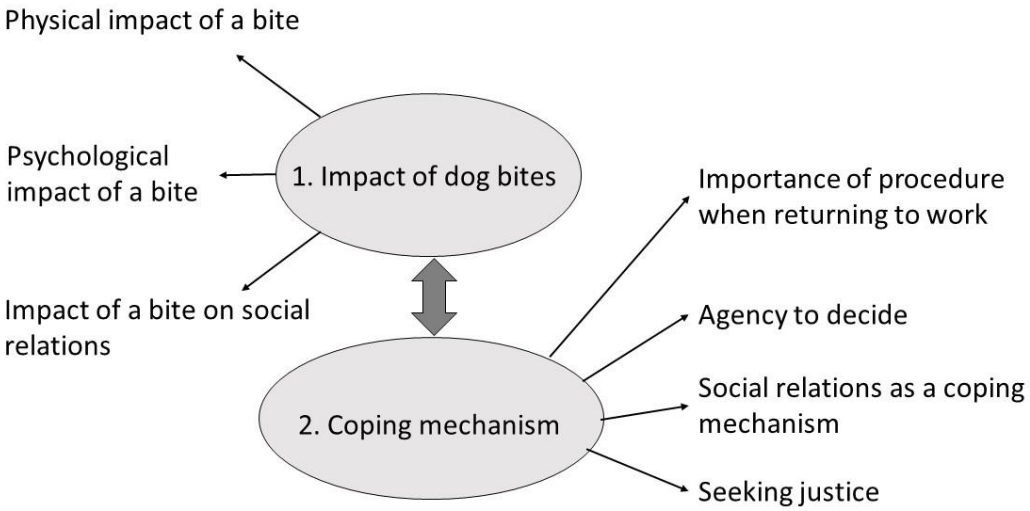


Figure 9.1. *Schematic representation of the impact of dog bites inform different coping mechanisms. Dog bites have both physical and psychological impact and also affect social relations with other people and dogs. The main identified coping strategies included relying on procedures when returning to work, having an agency to decide on interactions with dogs, relying on social relations and being able to seek justice.*

9.2.1 Impact of dog bites

9.2.1.1 *Physical impact of a bite*

Patterns of physical impact of bites has previously been described in greater detail (e.g. Mannion and Mills, 2013, for a summary of injuries received by the participants of this study, please see the Appendix 1). However, the subjective experiences of the physical impact of a bite have not been explored. Here, participants experienced bites as well as the medical procedures that followed as painful and traumatic, especially when injury caused by a bite was extensive:

"There was a seven-hour cleaning session of my wounds. (…) They did it before I went to sleep and then I could still feel while I was partly awake (…) and it was horrible, horrible. (…)" Ryan, bite victim, bitten as a child.

Participants also discussed how the physical injury caused by the bite impacted their routines, showing that consequences of a bite can be experienced long after the incident occurred:

"For months after, I had to have all my food cut up for me. I couldn't write. I couldn't drive. (…) I couldn't pick anything up. I just couldn't use this hand at all. (…)" Ben, Delivery Company.

In addition to the physical injury, the impact on daily routines could have a secondary effect on participants' mental health.

9.2.1.2 *Psychological impact of* bites

Dog bites affected individual's self-esteem in multiple ways for example by altering their body image and making them doubt their skills and abilities to handle dogs and protect their own children. Among female bite victims, bites had an addition impact on individual's wellbeing due to the visibility of a scar, which affected their confidence:

"The hardest thing was I had to start a new senior school with this big scar. The stitches were prominent, dark, purple stitches with the iodine on and stuff, then they had to dry and fall out, so I entered a really important part of my life with a really noticeable scar. I was really self-

conscious and I was picked on because of it (…) Throughout senior school, I felt like I was the Elephant Man, it actually did feel like a huge, physical disfigurement and that was probably to do with how I was treated. (…) Ely, bite victim.

Bites had a similar impact on self-esteem of other female victims, showing that the impact of bites can potentially be gendered.

In professional environments, bite victims were often blamed for being bitten, as described in Chapter 6, which made them question their skills:

"I think the reason why I was quite concerned was because I replayed that moment in my head so many times (…) feeling like, "Oh, my gosh, I've missed the signal. I've missed it," and then you feel guilty that you've missed the sign that they may have potentially bitten you or something. (…) doubting that you've not spotted it and just being angry with myself, that I've maybe not seen it." Kerry, Dog Shelter.

As bites were seen to work "against the dog", the impact of a bite on dog shelter workers was also amplified by feeling that as a result of a bite a dog may be euthanized or their rehoming process may be prolonged. As a result, by questioning their skills, dog professionals also questioned their identity.

Dog owners whose dog bit someone else also worried about the future of the dog and the risk of euthanasia. They described feeling embarrassed, judged and insecure in their skills and ability to be a good owner:

"It made me initially feel like a bad dog owner. It made me feel embarrassed. I cried a lot. When the police came I bawled my eyes out. I felt like my world had ended. I wanted to be a dog owner, and I still did, and I was petrified that she would be taken away from me and that it would be all my fault". Patricia, owner of a biting dog.

In addition, where a child was bitten, participants also described feeling that their parenting skills were questioned:

"They [doctors] thought that we were lazy parents because she'd been exposed in that way. And that we were neglectful parents, as if we let her roll round with the dog on the floor. Which obviously we weren't, but it felt like there was that kind of attitude towards us, definitely. (…)" Irene, mother of a bitten child, owner of a biting dog.

Irene's experienced her identity as a responsible dog owner and a good parent being undermined as she experienced being judged and blamed by the medical professionals. Later in the interview she described how she felt that doctors interacted with her husband and her mother in law differently, with more respect. She believed that her experience was therefore gendered and worsened by her positionality of being a young, non-working mother.

This illustrates that dog bites impacted on participants' wellbeing in many ways and often led them to question their identity, which affected their self-esteem.

9.2.1.3 *Impact of a bite on social relations with people and dogs*

Bites had an impact on social relations with people and dogs, which further impacted participants' wellbeing. For example, participants avoided visiting family who had dogs, as described in Chapter 6. Bite victims experienced loss of confidence, distress and even trauma after observing a bite (see emotional responses in Chapter 8), but so did witnesses and colleagues. For example, Sarah described how after observing her colleague being bitten, her experience and response to mouthing (i.e. dog squeezing a person with their mouth in context of play or when frustrated) changed, making it hard to work with dogs:

"It can make you stupidly aware, (…) the next day we went in the exercise yard with Django [dog], (…) and literally he just mouthed my hand and I had a full meltdown. I wanted him out of the exercise yard, (…). I didn't want to be near him." Sarah, Focus Group Discussion, Dog Shelter.

This secondary impact of bites made Frank from one of the delivery companies argue that *"there's always more than one victim in a dog attack."*

Participants also described how a bite changed their relationships with dogs. They described being more wary and vigilant, adhering to work procedures more rigidly (Chapter 6). More extreme responses were also noted, for instance, one participant spoke about deciding not to have dogs in the future after witnessing her own dog bite her child:

"I would just worry all the time. Because we had a normal family dog one day and then, for no reason, he just bit her.(…) Because we'd rescued him, my husband was very close to him. He'd be the one cuddling him and things like that. Yes, I think he took it the hardest. Which is why I think he doesn't want another dog, because he can't bear the thought of something like that happening again. …… because it was our daughter as well. I think the combination of- because it was his dog hurting his daughter. I think that was just too much." Irene, mother of a child that was bitten.

Inability to understand reasons for the bite, distress caused by a sense of being betrayed by a dog and perception that nothing could be done to prevent bites in the future, informed Irene's decision not to keep dogs.

However, bites also strengthened relationship with dogs. Participants spoke about being aware that no one else will take care of their dog and thought that if returned to a shelter, a dog may be put down. This dependency made participants feel more committed to the dog:

"It made me want to be better, and it made me feel ashamed and embarrassed that I wasn't good enough (…) It didn't make me love her any less. I still loved her. If anything, it made me love her more... I felt like I owed her something." Pat, owner of a dog who bit someone else.

The impact of bites on social relations was therefore complex: it had both negative and positive effect on relationship with a dog, but also led to participants restricting interactions with family and friends.

9.2.2 Coping mechanisms

Participants described a range of mechanisms which helped them to ameliorate the impact of a bite. As outlined in Chapter 7 they used a range of "excusing tactics" (Sanders, 1990) to

justify bites, which them helped to cope with them. In addition, being supported at work, having an agency to decide when to interact with a dog or what happens after a bite, having social support and positive social relations (with people and dogs) and being able to seek justice after a bite were experienced as helpful.

9.2.2.1 *Importance of procedure when returning to work*

Participants described returning to work after being bitten as stressful, as a bite often made them more anxious around dogs and in some lines of work they could not avoid dogs. Occasionally, the return to work policies were not fully implemented, which further impacted on their experience. Both dog shelters and delivery companies often put bite victims on restricted or light duties, before resuming work to full capacity:

"I was having a lot of physio and stuff. I was glad to get back and get back into the routine of working. (…) *Then I just gradually eased into doing easy dogs. The little dogs that don't pull. I can't remember where the shift was where I went back into just, "There you go. Full duties."".* Mary, Dog Shelter.

In all lines of work where contact with dogs was required, the transitional period of light duties was indeed seen as crucial to help to heal physical injuries, but also overcome fear of dogs and regain confidence needed for the job.

While some shelter staff described being given easier dogs when adjusting back to work, in the delivery company an equivalent change for an easier delivery route with fewer dogs was not always possible, which impacted on the wellbeing of participants returning to work. Frank described how an element of luck helped him to adjust. Shortly after his injury, a previously planned revision of work meant he was assigned a route on which he was meeting fewer dogs:

"What I did was I came off that particular [delivery route] because there were a number of dogs on that [delivery route]. I was lucky. A couple of weeks' after there was a [redevelopment of delivery routes] and I picked a different [one], because there were less dogs on there." Frank, Delivery Company.

However, Ben was less lucky and spoke of the impact that lack of clear return to work policy had on him:

"(…) So I came back in, and I just felt a bit vulnerable (…), because there was nothing in place for me. (…) There should be somebody there you can talk to, even if it is the manager, and you can sit down and say, "Look, I feel the anxiety is too much for me for now. There's got to be a way of easing me back in.(…) That never happened." Ben, Delivery Company.

Clair who worked for a veterinary practice also described returning to work as a stressful and unorganised process:

"You sort of think*: "Oh, I don't know if I can do this job* anymore*." But slowly, over time, I got better. But nobody came and spoke to me. You know, sort of like "How are you? How would you like to change the situation? How would you make it better?" I did it all sort of myself (…) There was no clarity of procedures, you know, to follow (...)"* Clair, veterinary nurse.

Clair described that although the necessary procedures for returning to work after an injury may have been fulfilled, she did not feel supported by the organization, which made it harder to resume work. These examples highlight the importance of a clear procedures and safety culture in supporting employees in returning to work after being bitten by a dog.

Participant's' vulnerability when returning to work was potentially exasperated by their financial worries. Both dog shelters and delivery companies offered sick leave for dog bite victims, but in some organisations, this was paid for a limited time period, contributing to bite victim's decision to return to work sooner. In other organisation, a significant proportion of participants income was derived from working over-time, thus even with a sick leave pay, they were financially worse off.

9.2.2.2 *Agency to decide*

Agency to decide when and how to interact with a dog were described as helpful. For instance, Clara described how being able to choose when to interact with a dog helped her daughter to manage fear:

"It really needs to be on her terms. The other day we were in the pub and she was like "Oh, can I stroke the dog?" So I was just like, "Wow." So obviously, I asked the owner if that would be okay, and he said one of them not so much, but the other one, yes, would be fine, and she stroked the dog, and she was happy." Clara, mother of a child that was bitten.

Clair also described how although she did not feel supported at work after a bite, being able to avoid some dogs and implement specific precautions helped her to resume normal practice:

"I think we've put in more precautions. And people know (…) that I'd be like... right, I'm not handling the dog, if (…) I'm not happy with this dog. I will not [handle] them without a muzzle or just not touch it." Clair, bite victim, veterinary nurse.

Overall, where contact with a dog was a part of a job (e.g. in dog shelters or veterinary practice), participants could control interactions, whereas where dogs were just encountered at work (e.g. in a delivery company), their agency was restricted. In all contexts, lack of agency, and sense of helplessness after an incident occurred was described as frustrating and almost as distressful as the bite itself:

"I asked the owner [for his details and to control the dog] and he told me to f off. Horrid. I just carried on walking home. There was nothing I could do." Philip, bite victim.

Dog owners who experienced lack of agency in deciding on what to do with their dog after a bite occurred also described bite experience as distressing. For example, Irene felt judged by doctors and pressured to euthanise her dog. She explained that while she may have reached the same decision on her own, feeling she had no alternatives was extremely upsetting:

"We suddenly felt very, very much like, "Oh, we have to go and get it done now, and take him to the vet now." It was very much a rush (…) I think, (…) And just that when a vet and a doctor says to do something, it felt like we didn't have a choice." Irene, mother of a child who was bitten.

Having agency to decide how and when to interact with a dog was seen as a crucial coping mechanism for dog owners and bite victims alike.

9.2.2.3 *Social relations as a coping mechanism*

Participants relied on social support to cope with bites. For instance, Ely described that her body image improved when she started dating:

"I think I got a boyfriend when I was 18 who seemed to fancy me and like me, so maybe there was approval somewhere and validation in him finding me attractive and it moved me slightly away from…" Ely, bite victim

Participants also relied on others to carry on with daily activities. For instance, Nina explained how friends from her running club help her to scout the environment for dogs and shield her from any possible contact.

Colleagues were also perceived as a source of social support:

"I'd say like the people, the other staff members. They were really supportive. One of the nurses knew that I was like not happy about handling one of the dogs, she would do it"" Rosie, bite victim, Dog Shelter.

Participants described how the relationship with their own dog helped to buffer the negative experience of a bites. For example, one of the participants spoke about getting a dog after being advised by his counsellor that a dog will help him to cope with the experience of a bite by changing associations with dogs:

"I got- Daisy her name is, I got her to just get over it. (…) She's made me happier really, she has, yes" Ryan, bite victim.

Of all participants who were bitten by dogs and who were fearful, only one declared not interacting with dogs at all; everyone else described having at least some positive encounters,

often with just one “special” dog where they feel comfortable. These encounters did not necessarily outweigh the fear of dogs, but eased them into working and being in an environment where dogs were present.

9.2.2.4 Seeking justice

Some participants described striving to prosecute the dog owners and seek compensation as important. For instance, Adam explained his rationale for reporting a near-miss to the police as follows:

“I thought, "Well, [local] Police can give you a little education session." So I reported it” Adam, bite victim, Delivery Company.

Outside of a work context, some bites were reported to the police and dog owners described being interviewed after their dog bit. However, participants thought that in the majority of cases, aside for the police report, nothing else happened. Perception that police would not investigate the bite and community retaliations hindered bite reports and seeking justice:

“Interviewer: Did you follow it up in any way?

Alice: No, because it didn’t break the skin. I’m also in the type of neighborhood where, if you reported something like that, it would probably be more unsafe for you anyway. I also think, “What are the police going to do?” Probably not very much. (…) I think it takes, probably, a very serious injury before the police are very interested in what’s going on.” Alice, bite victim.

A combination of seeing dog owners as unwilling to control dogs (Chapter 7) and seeing herself as unable to rely on police help, meant that Alice avoided going to the park with her children, which she said impacted on her levels of physical activity as she could not afford the gym. Lacking agency to report a bite and seek justice (either as a result of perceived lack of police interest or difficulty in getting dog owners details, as shown earlier with a quote from Philip), was frustrating.

By contrast, being able to find a resolution, was described as a relief. For instance, Luke used community resolution scheme, which allows to settle a crime out of court. As a part of the scheme he asked the dog owner to insure his dog, take him to at least 6 dog classes and to replace his running shorts, which were damaged by the bite. Access to and awareness of community schemes may however differ between participants and the perception that nothing will be done after a bite can further hinder seeking help.

9.3 Discussion & Recommendations

This analysis extends current understanding of the impact of dog bites on the individual wellbeing in multiple ways. This chapter shows that dog bites can have a long-lasting physical impact on health and wellbeing. Participants coped with bites by: reframing them, relying on social support, having agency to decide when to interact with dogs, and being able to seek justice. In the remaining part of this Chapter, I will outline how an improved understanding of the impact of dog bites and the barriers to improving injury reduction could be used to design new strategies (Table 9.1).

9.3.1 Impact of a bite on relationship with the dog

Victims bitten by their own dogs can experience embarrassment and feel stigmatised for having a dog that others may perceive as dangerous (Westgarth and Watkins, 2018). Bites are also seen as a form of betrayal by the dog (Westgarth and Watkins, 2018). Therefore, reducing stigma linked with dog bites could improve wellbeing of owners whose dogs have bitten and encourage them to seek help, reducing the risk of future bites.

Several participants also believed that a bite fortified their commitment to their dog. The difference in the perception and experience of a bite could be explained by the relationship with the bite victim and the dog owner's perceived ability to address dog behaviour. Participants found it more difficult to accept a bite to their own child than a bite to themselves or other people. Owners who thought they understood why a bite occurred and saw themselves as able to prevent future bites were able to cope with the experience better than those who did not see themselves as response-able (Brown and Dilley, 2012). Raising

awareness of how to modify dog behaviour and where to seek help could reduce distress of owners who believe that euthanasia is the only solution, and thus improve welfare of dogs.

Some participants stated that positive interactions with dogs helped them to cope with a bite and one participant was encouraged to buy a dog to overcome fear of dogs. However, as dog ownership is a long-term commitment and there is no evidence to suggest it will help to overcome fear of dogs, this practice should be discouraged. At present, Dogs Trust offers meetings with selected, trained dogs under supervision as a way of helping children to overcome fear of dogs (Dogs Trust, 2019); this service could be extended to all bite victims.

9.3.2 Physical impact of a bite

Dog bites are at high risk of infection and require medical intervention (Lancaster, 2018). In addition to the physical impact of a bite itself, the treatment was also described as painful and sometimes traumatic. An earlier observational study of children who developed PTSD after a bite shows that children who received more severe bites *and* extensive treatment show more symptoms and for longer than children who did not receive similar treatment (Peters et al., 2004). In addition, here the visual appearance of bite wounds was felt to be stigmatizing, particularly among female bite victims. Beauty standards are gendered, i.e. women are judged on the basis of their appearance more so than men and expected to maintain a feminine and young look (which does not include scarring or visible injuries (Jackson, 1992)). Consequently, across most types of injuries where impact is visible, female survivors usually suffer more and longer psychological consequences (Katz et al., 2003, Connell et al., 2015), as suggested here.

Dog bites may further impact on physical health by leading to a reduction in physical activity. Children bitten by a free roaming dogs reduced their activity as a result of fear of dogs (Vargo et al., 2012). Here a number of participants explained how both the injury caused by dogs and fear of dogs affected their daily routines, including physical exercise.

9.3.3 Coping with dog bites

Impact of traumatic injuries can be reduced through early psychological support, which can alleviate the distress caused by treatment as well as the injury itself (Birur et al., 2017). In the case of dog bites, psychological support should be extended to witnesses, parents of injured children and owners of biting dogs, as all of them may experience bites as distressing.

Bite victims used a range of tactics to cope with stressful experiences. Excusing tactics (Sanders, 1990) helped to justify and normalize a bite, which in turn allowed them to preserve a relationship with a dog, as explained in Chapter 7. Participants who were able to control how and when they meet dogs after a bite and who could decide about the consequences of a bite for their own dog coped with the experience better than those who could not make this choice. Psychosocial stress is often caused by the sense of not being able predict or control events rather than the events themselves (Sapolsky, 1994, North et al., 1996). It is possible that delivery workers experience dog bites as particularly distressful as within their line of work, as they often cannot see a dog before coming into contact with them and rely on dog owners to secure dogs (as described in Chapters 5 and 6).

Finally, participants being able to seek justice after a bite helped them to cope with a bite experience. Reporting crime is linked with a sense of power to protect others and helps victims to validate their suffering, which can improve mental health (Herman, 2003). Inclusion of victims in justice system (e.g. through community resolution programmes) can further improve their satisfactions with resolution, even when the desired outcome is not met (Herman, 2003). Here, only one participant (indeed involved in a community resolution programme) was satisfied with the police investigation and its outcomes. Most bite victims believed that police will not take a bite seriously. Bites were also not reported due to fear of retribution. Improving transparency of dog bite investigations and promotion of community resolutions where appropriate, could give dog bite victims a sense that bites are treated seriously, and thus improve their wellbeing as well as potentially improve safety for others.

9.3.4 Support at work

Clear return to work policies, including strategies for managing an injury when back at work and supportive social relations at work, predict an individual's return to work after an injury

(Soeker et al., 2008, Tjulin et al., 2011). By contrast, psychosocial stress, inadequate work policies and insufficient training, hinders return to work (Soeker et al., 2008). Our participants described the importance of having a clear return plan based around a gradual reintroduction to normal duties as important. Participants were frustrated when such a plan was not developed and often interpreted it as a sign of lack of care over their wellbeing. The reliance on procedures when returning to work reflects the psychological comfort linked with having routines or relying on personal protocols when coping with risk, discussed in Chapter 6 (Giddens, 1990).

Support of co-workers can help a victim to overcome the sense of being misunderstood by the employer, as colleagues often help to clarify procedural difficulties (e.g. while seeking compensation) and offer practical support in daily work routines (MacEachen et al., 2006). This was also observed here; victims relied on support of significant others and colleagues to alleviate anxiety, but also to carry out daily tasks at work and at home. As co-workers are instrumental in executing return to work policies, they should be included when developing return to work plans (Tjulin et al., 2011).

Table 9.1 offers a summary of practical recommendations on addressing barriers to reducing the impact of injuries caused by dogs.

Table 9.1. *Recommendations on addressing barriers to reducing impact of dog injuries outlined at a level of medical practitioner, not for profit organisations (e.g. parents support groups and dog shelters) and workplace.*

Problem	Intervention
Lack of awareness and knowledge regarding impact of dog bites and treatment of dog bites on mental	MEDICAL INSTITUTIONS **New service provision:** Psychological interventions are effective at reducing the impact of traumatic injuries and trauma related to treatment itself (Brand et al., 2018, Brooks et al., 2018, Birur et al., 2017). Dog bite victims could be provided with relevant psychological support.

health and wellbeing	**Information provision:** As many bite victims and parents visit hospitals and general practice clinics after being bitten, medical institutions should signpost dog bite victims to resources regarding seeking help for dog behavioural problem, appropriate supervision of children around dogs and dog bite prevention. Resource packs could be developed by national and local dog-related charities and parent groups. **Improving knowledge** Professionals attending training on dog bite prevention and impact of dog bites. NOT FOR PROFIT ORGANISATIONS **New service provision:** Development and management of in-person and online support groups for parents whose children were bitten by dogs and dog owners whose dogs have bitten someone else. Offering bite victims to meet friendly dogs under supervision. **Resource development** Development of online dog bite prevention workshops for parents and medical practitioners. WORKPLACE **New service provision:** Training for workplace mental health first aiders to offer support for bite victims

	Provision of opportunities for bite victim to discuss their incident with colleagues. **Improving knowledge** Management attending training on impact of dog bites.
Lack of knowledge and skills to address dog behaviour problems	NOT FOR PROFIT ORGANISATIONS **New service provision** Provision of affordable dog training classes and behaviour advice. **Raising awareness** A campaign to raise awareness that dog behaviour can be changed. **Improving knowledge** Education to highlight a range of environmental and individual factors that contribute to a bite.
Stigma associated with dog bites	NOT FOR PROFIT ORGANISATIONS **Addressing social norms** Using role models to show the behaviour helps to influence social norms and encourages others to adopt a new way of behaving (Donaldson and Carter, 2005). Promotion of help-seeking among the dog owners could be achieved by using role models, such as celebrities or by featuring help-seeking behaviour in popular TV dramas. Pledging to change behaviour increases chances of adhering to the target behaviour and promotes further knowledge-seeking (Chaintarli et al., 2016). Dog owners acquiring or rehoming a dog or puppy could be encouraged to pledge seeking help in case they encounter problems.

	Change perceptions Mental health campaigners strive to re-present help-seeking as a strength and not weakness (BMA, 2017, Divinity, NA). A parallel campaign could depict seeking help as a part of being a committed dog owner.
Poorly designed or implemented return to work policies	WORKPLACE **Change in policy** Involvement of injured staff in development of return to work policies to reflect the victim's experience. Return to work policies clearly account for the role of co-workers in helping an injured person resume normal duties or adapt to new work routine. **Change in management** Review of work routines to ensure a bite victims are able to carry out their duties safely.

9.4 Conclusion

Due to lack of awareness of the impact of dog bites on wellbeing, and limited funds, most support to bite victims is focused on acute care. Dog bites can however have a cascading and much broader impact on individual physical and mental health, their professional and social identity and social relations. By understanding the nature of this impact, it is possible to design strategies which may result in reducing the injury and distress caused by bites after they occurred. As not all bites can be prevented, further recognition of the improvements which could be made to the medical and psychological support to bite victims, work policies and social norms regarding seeking help is therefore important.

10 **Discussion**

The overarching aim of this thesis was to: examine the experiences and perceptions of dog bites among people with different experiences of dogs and dog bites, and; evaluate the practices related to managing risk and negotiating safety around dogs.

This study can be situated in a context of the changing nature of human-dog relationships. It has been suggested that the welfare of the UK dogs is deteriorating due to: reduction in dogs' activity levels; increasing rates of obesity; high prevalence of untreated fears and behaviour problems; prolonged periods of social isolation; decreasing vaccination uptake; and increase in popularity of breeds with known health problems (PDSA, 2019b). Dogs are also often seen as a commodity and dog accessories are gradually becoming an important way through which owners bond with dogs and express their affection (Vänskä, 2016). Increasing popularity of using dogs as emotional support animals (Younggren et al., 2016) and in therapy (Wells, 2007), as well as significant publication and media reporting bias suggesting a strong beneficial effect of dog ownership on health and wellbeing (Herzog, 2011), also potentially affects expectations regarding dog ownership. In addition, the subject of bite prevention is generally controversial, with many strong opinions regarding the best approach and in particular, the relevance of breed specific legislation (Cohen and Richardson, 2002, *Dangerous Dogs Act 1991*, 1991). This study was purposefully located within Merseyside, as it is often reported as the dog-bite capital of the UK (Taylor, 2015).

This research departs from traditional approaches to studying dog bites through epidemiological methodology and understanding of dog bite prevention as centred on education about dog's body language. The approach taken here aimed instead to explore dog bites from the perspective of those directly affected, as a victim, an owner and those at risk of being bitten due to exposure to dogs at work. The objectives of this study included understanding how dog bites are perceived and experienced and how the context of individual lived experiences (shaped by their communities, social relations, work environment and broader policies and legal system), influences these perceptions and practices around dogs. The study also aimed to learn how a bite may influence the relationship and interactions with a dog and to scrutinise how, if at all, the consequences of dog bites shape the perception

of risk and safety around dogs and subsequent interactions. To describe and explain these findings, social theories of risk and literature on accident prevention and injury reduction were drawn on. Building on the analysis, a range of approaches to dog bite prevention and injury reduction were discussed building on the COM-B model (Michie et al., 2011) and other approaches to behaviour change.

Studying how dog bites are perceived by YouTube viewers (Chapter 4) illustrated how viewers as third parties attribute responsibility for prevention to an individual and attribute blame for a bite to victims or dog owners but rarely dogs. This view was echoed in the analysis of serious dog bite injuries within work contexts (Chapter 5). Here, the remedial actions described by the employers showed that workplace bite prevention interventions focus on changing individual behaviour. Other approaches, such as environment modifications and measures to alleviate the impact of an injury after it occurred were rare. This chapter also illustrated that delivery and dog shelter workers receive more bites than other professionals and highlighted two most common scenarios in which bites at work occur: entering or delivering a parcel to a property, or handling dogs in a veterinary practice or dog shelter.

In Chapter 6 it was found that procedures and routines were used to identify risk when working around dogs. Procedures were adapted to reflect individual experience, and sometimes negotiating safety was perceived as necessitating not following the formal policies. In Chapter 7, a complimentary approach to identifying and managing risk was identified. It was argued that trust was used as a proxy for risk identification, but also paradoxically, led to taking risk in interactions with some dogs. Trust in dogs developed through relationships and interactions with dogs, and these relationships with dogs also engendered feelings of commitment to the dog, and while the commitment motivated a person to care for the dog, it occasionally put dog owners and other people at risk of bites.

In Chapter 8, a final safety strategy, relying on emotions, was described. It was suggested that emotions and feelings are used to recognise and respond to perceived risk as they shape body techniques used in interactions with dogs. Emotional management was therefore seen as a way of preventing bites. Finally, in Chapter 9, the impact and experience of bites on victims and dog owners was described. It was suggested that aiming to reduce the injury (rather than just prevent bites) could improve individual experiences of dog bites and their impact.

In this summary Chapter, the discussion presented in earlier Chapters is extended to elucidate the common themes. A summary of broader implications of this research is also offered in addition to an evaluation of its strengths and limitations. Suggestions for future work are made and conclusions are drawn.

10.1 Individualisation of risk and responsibility

Risk of dog bites was not generally seen as an outcome of interactions between people, dogs, and the environment, a view often taken by dog behaviour experts (Overall and Love, 2001). Instead, risk was often described as inherent to that *individual*: risk was identified on the basis of individual characteristics (of the dog, the owner, or bite victim) and seen as individual responsibility. Bite prevention procedures also reflected this view: they were typically articulated at an individual level and when rolled out across the whole organisation, it was the individual who had to become more resilient to dog bites through equipment or training. Locating risk within an individual meant that bite victims and dog owners (and on rare occasions dogs) were blamed for bites. Below, similarities between individualisation of risk and responsibility for dog bite prevention and a broader discourse around individual responsibility for health will be discussed first. Implications of individualisation on seeing bites as a moral problem will be elaborated on later, before discussing a need to re-conceptualise bites as relying on structural, system-wide efforts, rather than an individual alone.

10.1.1 Individualisation of risk and responsibilisation in the context of health

This articulation of risk reflects a broader social change which results in seeing health management as an individual responsibility. Following from Beck's (1993) and Gidden's (1990) discussions on individualisation of risk, health sociologists show how within different health contexts, individuals are seen as responsible for managing their health and wellbeing by regulating their lifestyles (Petersen, 1997). This contributes to a perception of illness as a moral failure and ill individuals as failing to be responsible, self-caring citizens (Petersen, 1997). The process of individualisation and responsibilisation has been described for obesity (Share and Strain, 2008), cancer (Rockhill, 2001), diabetes (Jallinoja et al., 2007), pregnancy (Lupton, 1995, Lupton, 2012) and other conditions. The focus on bite prevention through

individual education and the legislation which argues that responsible dog ownership is a way to prevent bites (*Dangerous Dogs Act 1991*, 1991) can be interpreted in the same way. In this study, not following steps believed to prevent bites (e.g. not following work procedures, educating oneself about dog's body language, controlling emotions etc.) was discussed as problematic and risky. This meant a person became "at risk" but also was perceived as a source of risk for others, and their work practices were reprimanded, as further discussed below.

In other words, concern over dog bites has not always been expressed in the same terms and shifted from fear of rabies during the Victorian times to fear of dangerous dogs and irresponsible dog owners, prevailing today (McCarthy, 2016). The emphasis on dog bite prevention through making dog owners more responsible is therefore imbued with historical and cultural representations of what is currently perceived as a risk of bites, rather than an actual solution to the problem.

10.1.2 Bites as a moral problem

As a consequence of attributing dog bites to irresponsible behaviour, bites were subsequently framed as a moral problem. Being bitten was perceived as a result of being an irresponsible dog owner, parent or employee. Bite behaviour was also seen (sometimes) as a reflection of a dog's (bad) character, not an outcome of interactions. Moralisation of bites resulted in dog bites being stigmatised; dog owners and victims felt embarrassed for having a biting dog or being bitten. Stigma meant that owners often continued to act unsafely (e.g. by not seeking help or admitting that their dog is likely to bite), as paradoxically these practices helped to outwardly deny that their dog was dangerous. In addition, dog bites were very often seen as preventable. This contributed to blaming the individual seen as responsible for the bite. Therefore, paradoxically in some cases, the perception of preventability also contributed to blame and stigma. In this way, individualisation of bites also had a potential negative impact on victims' health by affecting their mental health. At the same time, perception of preventability was also potentially constructive, as it enabled the belief in personal self-efficacy. If a person knew how to prevent future bites, they had a sense of control around dogs, which helped to cope with being at constant risk of bites (e.g. in dog shelters or veterinary practice) and made interactions with dogs easier.

10.1.3 Importance of structural changes in dog bite prevention

In the course of fieldwork and interviews with participants, I noticed that my own ideas about bite prevention had changed. At the beginning of this study, I believed that dog bites can be prevented through better understanding of dogs' body language, as my ideas were based primarily on working hands on with dogs in dog shelters. While changing individual behaviour (e.g. by improving knowledge of dogs body language) can help to prevent dog bites in some cases, this research shows that successful dog bite prevention requires structural interventions at a social, environmental and policy levels (Holmberg and Parascandola, 2010) that reflect broader experiences of interactions with dogs. Doing this is difficult. Structural interventions have been restricted by the austerity measures introduced in the UK after the 2007 financial crisis, which led to cuts in funding to health promoting programmes, in particular in regions that already suffer from worse health outcomes, such as Merseyside (Bambra, 2019). In addition, in order to promote economic growth (perceived to be hindered by market regulation), "regulatory austerity" measures, i.e. regulatory reforms aimed to reduce the red tape primarily through the establishment of Better Regulation Executive, were rolled out (N/A, 2018). Simultaneously, between 2010-2015, creation of new legislation was hindered through an introduction of "one-in, two-out" rule (N/A, 2014). Under this rule, where a new regulation was introduced that would lead business to incur a cost when complying with it, existing regulations had to be removed or modified, so that for each extra £1 of costs, £2 of savings were made (N/A, 2014).

The austerity measures contribute to promotion of a responsibilisation discourse, which leads to blaming individuals for poor health (including bites), without recognising the up-stream factors outside of individual control that contribute to this risk in the first place (Bambra, 2019). Although the "one-in, two-out" rule was discontinued in 2015, the suggestions of a recent government consultation on this subject reflects the historical trend which shows favouring education and promoting responsible dog ownership (over legislative change) as a solution to dog bites (Westgarth et al., 2019, EFRA, 2019). This is despite lack of evidence to suggest that education alone would indeed lead to a reduction in a number of dog bites. In addition, relying on responsible dog ownership as a way of preventing bites rests on the

assumption that there is a shared societal understanding of what responsible dog ownership entails, i.e. that the behaviours prescribed under this banner are clear, and indeed lead to reduction or risk in interactions with dogs. This may not always be the case (Westgarth et al., 2019).

Further to this, the governmental messages of breed specific legislation and responsible dog ownership may inadvertently contribute to unsafe practices by contributing to a misconception that only dogs of specific breeds are dangerous and stigmatising dog bites by invigorating perception that owners whose dogs have bitten are irresponsible, hindering help-seeking. Individualisation of risk and responsibility for dog bites, promoted through responsible dog ownership message, may hinder an understanding of bites as an outcome of complex relationships with dogs that unfold over time and detracts attention from other (legislative) measures which could be more useful.

Finally, individualisation of risk and responsibility juxtaposes with the experience of successfully negotiating safety (discussed in detail below), which was described as fundamentally social and co-operative process, where individuals could better avoid risk if there were mechanisms to communicate it between them.

10.2 Safety as a social process

Negotiating safety around dogs often required help of others, use of equipment and understanding of how the environment may shape the interactions. In addition, risk assessment was influenced by social relations with other people and dogs. Social relations also shaped the experience of a bite.

10.2.1 Negotiating safety in the context of social relations

Safety was impacted by and required coordination of an extended network of 'actors' (dogs, spaces, family, and colleagues, as well as policies and social relations). Actors can be understood here in a way articulated in an Actor-Network Theory, i.e. as anything (policy, object, idea, animal, legislation, person etc.) that contributes to social interactions (Latour, 2005). For instance, participants believed that the whole family needed to co-operate to

approach dog behaviour consistently, but they also recognised the role of space (e.g. doors left ajar) in creating risk. A unanimous commitment was perceived as a prerequisite to manage potentially dangerous family dog (Chapter 7). Within a work context, cooperating with colleagues and relying on them to adhere to policies by e.g. assessing the risk posed by a given dog, while handling dogs, or when reporting dogs accurately during a previous interaction was also described as crucial (Chapters 6 and 7). Negotiating safety required management of inanimate objects too. For example, effective body techniques relied on being aware and making the most of the space in which the interactions were occurring (knowing how the space could "work against you") and using appropriate equipment (e.g. muzzles) (Chapter 8).

Social relations also introduced risk in encounters with dogs. For instance, while participants were aware that dog's behaviour may change when in pain or suffering sensory-loss linked with aging, they did not routinely alter interaction rules with familiar dogs in those circumstances, expecting dog to act as usual even when showing unusual behaviours (Chapter 7). In addition, dog shelter workers believed that prior social interactions and experiences that a dog had with people affected the safety in a given moment. Additionally, relationships with colleagues, customers and dogs hindered reporting of bites, which perpetuated risk to others in the future. This highlights that the temporality of risk posed by dogs and co-operative efforts needed to manage it should be considered broadly (Chapter 7). Focus on practices that could help to manage risk in a given moment may be inadequate in many cases. Framing risk management as social process, i.e. a way of managing a network of animate and inanimate actors, helps to appreciate the role pre-existing social relations, physical environments and equipment play in negotiating safety. These relations need to be considered when planning bite prevention.

10.2.2 Impact of bites on social relations

Experience of bites also affected social relations. For example, being bitten made people more wary around dogs, which shaped their practices. Bite victims avoided some family members who had dogs, and owners whose dog bit a family member felt it reflected on their family roles. At the same time, experience of a dog bite was also mitigated through social relationships (Chapter 9), for instance, help from colleagues when returning to work after an

incident, or friends gatekeeping a victim's access by dogs. As discussed in Chapter 9, social relationships with dogs also helped to overcome fear and re-build confidence after a bite.

10.2.3 Assessing risk of dogs in the context of social relations

Risk assessment was influenced by social relations with dogs. Participants understood dogs in dual way: as both social 'persons' and instinctive 'animals' (discussed in Chapters 4 and 7). These two perspectives do not need to be seen as conflicting, instead they could be viewed as complementary. Participants justified cautious disposition to dogs when they thought dog behaviour was driven by instincts and when they recognised dogs as 'animals'. This view also helped to explain particular, undesirable behaviours, such as bites, that occurred or could occur despite dog's socialisation and training. Seeing unwanted behaviours as instinctive and "hardwired" made it difficult to interpret them as socially inappropriate, which in turn helped to explain and excuse these behaviours.

Participants generally recognised that dogs transformed into social 'persons' as a result of enculturation, socialisation and training. Seeing dogs as social 'persons' enabled dog owners to bond with them. This view helped to justify and cultivate trust in dogs, which in turn helped to maintain close social relationships and engage in relaxed interactions. However, while most participants agreed that dogs on principle could act like animals, they were also confident that *their* dog would not act towards them out of instinct (Chapter 7). It is possible that trusting dogs, spending time with them and seeing them as social 'persons' could shape perception of how likely it is for own dog to bite (Westgarth & Watkins, 2015). This perhaps helps to explain why people can be knowledgeable regarding dog behaviour and body language and not act on this knowledge around familiar dogs. In other words, seeing dogs as social 'persons' may discourage cautious behaviour.

Therefore, retaining and deliberate cultivation of the dual view of dogs could aide dog bite prevention. Seeing dogs as both 'animals' and social 'persons' makes it possible to use safety measures around most trusted dogs, acknowledging that even they may act out of instinct. Highlighting instinctive behaviour of dogs could also help to explain problematic behaviour to owners who see aggressive behaviours as a betrayal of trust. This could also reduce a stigma linked with owning an aggressive dog. Emphasis on dogs becoming social 'persons' in course

of enculturation could in turn help to encourage ongoing, lifelong training and socialisation of dogs.

10.3 Subjectivity and situatedness of risk

Although work safety protocols and bite prevention campaigns often describe dog bite risk as objective (i.e. clearly defined, and easy to identify), in practice risk was experienced subjectively (Chapter 6, 7 and 8). Participants identified risks posed by dogs by relating it to their experience, situated and partial knowledge (Haraway, 1988). As a result, perceptions of what counts as a hazard or risk linked with dogs differed.

10.3.1 Using own experience to identify risk

A diversity of situated experiences shaped what was recognised as risk in relations with dogs and how dog bites were experienced. For instance, Sandra described how returning from a maternity leave made her more risk averse, illustrating how perceptions of risk were shaped by social relations and social roles (in this case, being a new mother, Chapter 7). In Chapter 9, Ely explained that the injury caused by a bite impacted on her self-esteem, highlighting how experienced of bites can be gendered. Approaches to managing risk of dog bites were influenced by person's history with dogs and an individual dog, previous experience of dog bites, individual's social relations and social roles, their knowledge of their own ability to regulate emotions, physical abilities and skills around dogs, formal knowledge of dog behaviour, work environment and policies and context in which interactions with a dog were taking place. As a result, participants did not have unanimous views of risks from interacting with dogs, highlighting a challenge to dog bite prevention.

Experiential and situated knowledge also shaped how the protocols and procedures at work were implemented, as discussed in Chapter 6. Formal training and learning, both about dog behaviour and work procedures, as well as work safety culture, contributed to participant's perceptions of risk. However, safety procedures were not always followed. Timmermans and Berg (1997,p. 275) argued that "protocols do not work because of the docile submission of (…) personnel, but through their ability to actively manage its contingencies". In other words, protocols are re-enacted within local universality, which relies on an informal network of

social relations between colleagues, informal learning, as well as shared experiences gained through work (Timmermans and Berg, 1997). Overall, policies studied here did not recognise the way pre-existing, often informal, social relations may facilitate and confine enactment of protocols. However, some formal work safety procedures, in particular in dog shelters, explicitly left space for subjective judgment, effectively acknowledging the local universality of shelter work and a need to mobilise experiential, situated knowledge to recognise risk.

10.3.2 Understanding risk identifications using relational theory of risk

Participants identified and responded to different risks in relation to dogs. Risks were selected, rather than simply being reflective of actual dangers around dogs, as proposed in socio-cultural risk theory (Douglas and Wildavsky, 1983). Risk that participants identified reflected individual and group (organisational) values and further contributed to shaping their identity. The relational theory of risk which describes the relation between risk objects and objects at risk builds on Douglas theory and is helpful in making sense of a landscape where different perceptions of risk co-exist. Briefly, *risk objects* are things recognised as dangerous within a context of situated knowledge (Boholm and Corvellec, 2011). For example, within protocols for risk managements at work, dogs were recognised as risk objects. At work and in other contexts, participants identified them in this way by assessing dogs' characteristics (such as breed or reputation) and with respect to the context of encounter with dogs (e.g. when entering a private property) and participant's situated knowledge shaped these identifications.

Objects at risk are things that are seen as valuable that need to be protected from risk objects. The *relationship of risk* is "the relationship an observer establishes between a risk object and an object at risk, the former being held to threaten the value of the latter" (Boholm and Corvellec, 2011 p. 180). The relationship of risk is contingent on being able to imagine the unfavourable conditions that are hypothetical. It also is causal: the risk object has to be perceived to threaten object at risk (Boholm and Corvellec, 2011). Importantly what or who is identified as object at risk or risk object and the relationship between them is not fixed: "[w]hat is a risk object for some can be an object at risk for others" (Boholm and Corvellec, 2011; p. 182, see Figure 1 for summary). In the earlier example, employees were recognised

as objects at risk. However, identifying oneself as a dog lover meant that participants also identified dogs as objects at risk due to perceived consequences of dog biting for the dog. In these circumstances, dogs switched from being risk objects to being objects at risk and procedures designed to protect people (e.g. reporting bites) were seen as risk objects. In other words, participants often identified a causal relationship between following procedure and harm done to objects at risk (their identity as dog lovers and dogs). Differences in identification of risk objects and objects at risk highlights a need for audience-specific bite-prevention campaigns and clear descriptions of desired practices, rather than assuming shared understanding of what risk management entails.

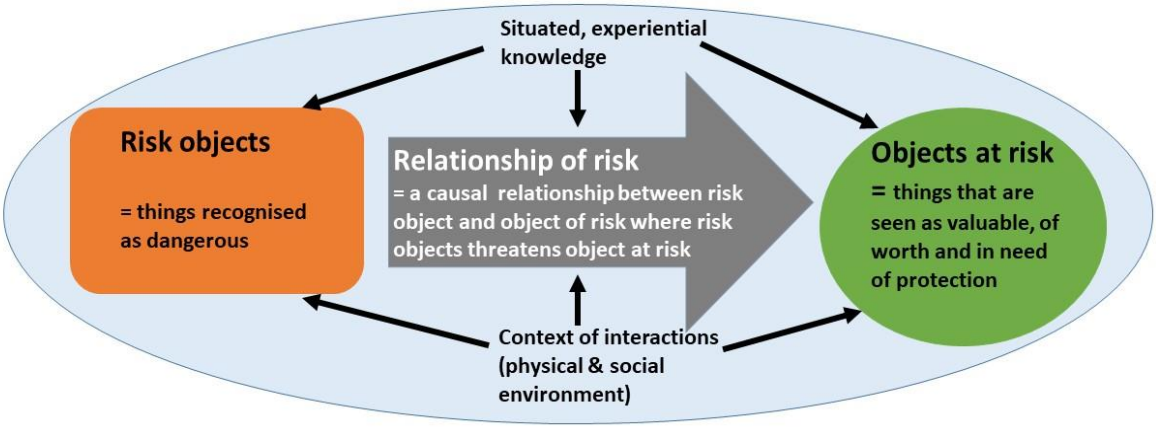


Figure 10.1. *A summary of relational theory of risk (from Boholm and Corvellec, 2011).*

Participants also identified that a bite threatened their relationship with dogs by making them fearful or uncomfortable around dogs and challenged the way they typically interacted with dogs before the bite. In these contexts, relationship with a particular dog and dogs in general become objects at risk. To maintain positive relationships with dogs, and the confidence to work with dogs, participants often used "excusing tactics" (Sanders, 1990), which helped to normalise and reframe bites and undesirable behaviour. For the same reason, bites were also regularly described as separate from a dog's character. Therefore, excusing tactics and separating bites from a dog's character hindered identifying a relationship of risk between a bitten person and a dog. This helped bite victims to maintain a relationship with a dog, as dogs were not seen as risk objects. However, an unintended consequence of perception was that occasionally, owners were also able to ignore dangerous behaviour of their dogs and failed to reduce the known risk, by e.g. not muzzling their dogs while in public.

At work, individuals often identified other, more concerning risk objects, than dogs. They worried about: their relations with colleagues and customers; lack of social support after a bite; being blamed for the incident; stress linked with the process of returning to work; and loss of income. The discrepancy between what participants experienced as at risk and what was inscribed as risk in formal work policies made participants diverge from work procedures. Furthermore, participants were often cynical regarding reasons for having safety procedures in the first place. In the delivery companies, procedures were often described as a box-ticking exercise, aiming to attribute blame and responsibility for managing safety onto frontline staff rather than measures which aimed to improve safety. These perceptions meant that procedures were sometimes understood as contributing to uneven power relations within the workplace, as they enforced regulations which limited individual practices (Foucault, 1991). In this context, procedures were seen as a risk objects and adopting what "worked best for you" could be seen as a form of resistance.

In summary, situated knowledge and contextual risk assessment contributed to identifying different risk objects and objects at risk in the context of dog bites. This made enforcement of standardised policies and protocols regarding interactions with dogs challenging, and also often led to what could be viewed as risky or irresponsible actions.

10.4 Sensing risk and safety

Risk in interactions with dogs was identified and managed by drawing on three overlapping strategies: through routines and procedures; trust and sense of responsibility for the dog and emotions and intuition. In this thesis, these mechanisms and their consequences were presented as distinct Chapters, but in practice, participants relied on all of them. For instance, while conducting a formal assessment of dog behaviour, they relied on a procedure, but also reflected on how a dog made them feel and relied on intuition about the given dog.

10.4.1 Comfort and risk in in-between strategies for managing risk

In-between strategies (Zinn, 2008) for managing risk serve a dual purpose; in addition to helping to avoid injury, they alleviated the uncertainty regarding risk. Giddens (1984) argues

that risk is managed through routines to avoid the anxiety linked with searching for the best approach and Sztompka (1999) proposed that trusting people serves a similar purpose. Zinn (2008) demonstrated the same for managing risk with "in-between" strategies, such as trust, intuition and emotions. Therefore, reliance on these mechanisms when negotiating safety around dogs helped participants to control dogs but also provided them with psychological comfort by reinforcing a belief in self-efficacy. For example, Frank argued with a colleague who continued to use treats when delivering post, which was against the organisations' policy (Chapter 6). However, as Harriett advocated, small, daily routines like this helped workers to feel more in control and able to continue to work, in contexts where the risk of being bitten was experienced as high.

These strategies helped to negotiate safety but also contributed to risk. As described earlier, seeking psychological comfort and in particular, a desire to maintain trust in dogs, paradoxically sometimes meant ignoring a dog's behaviour and acting unsafely. Routine and procedures helped people to interact with dogs in a structured manner and relieved participants from identifying all risks. However, participants worried that the routine used when interacting with dogs also desensitised them from identifying risk using emotions and intuition (Chapter 8). Conversely, participants also described how a bite made them feel extra sensitive to dog behaviour (i.e. it intensified intuitive risk identification, Chapter 8) and made them unable to act safely around dogs. Successful negotiation of safety in human-dog encounters required following procedures and routines, where these were available, but also knowing when to change the approach towards the dog, in response to identifying one's emotions or by following intuition.

10.4.2 Risk management as an embodied practice

When interacting with dogs, risk was experienced as a gut feeling, which helped to guide the right body techniques. Consequently, risk assessment was best described as embodied: it was sensed in the stomach, experienced as trembling hands and accelerated breathing, but also based on prior experience and knowledge. At the same time, these sensations were not always accurate. For example, participants often described not feeling like that dog would bite them, which led them to continue to interact with a dog, resulting in a bite.

Participants thought emotions contributed to risk as they were contagious: human emotions were thought to spread to dogs, affecting their behaviour. Being unable to carry out the emotional labour (i.e. being able to reinforce and correctly project calm emotions and confidence, while supressing fear and related behaviours) needed to adapt body techniques was perceived a risk.

10.5 Implications for dog bite prevention

The educational approach to bite prevention is grounded in a knowledge deficit model (Jones, 2008). It assumes that the problem – high risk behaviour – occurs due to a lack of knowledge regarding dogs' body language and that addressing this deficit will cause safer behaviours. However, many participants who were bitten had dog behaviour knowledge to prevent bites but acted on their sensations, or did not update their perception of a known dog by recognising that pain or other medial issues may affect their behaviour, illustrating a limit of education-only approaches to prevention. This research illustrates how dog bites fit with the Dahlgren and Whitehead (1991) model: factors at an individual, family, community, environment and policy level influence the experience of bites and consequently, bite prevention needs to be addressed through interventions reducing risk at all of these levels dog bite prevention fits with occur due to multiple factors, and importantly. Education as a tool for dog bite prevention is not always successful as it rests on the assumption that people with appropriate knowledge act towards dogs rationally, i.e. that they rationally assess dog behaviour and respond to it drawing on their knowledge. In addition to knowledge of dog behaviour, human-dog interactions draw on individual intuition, emotions, and body techniques. They reflect a situated history of a relationship with a given dog. They are also embedded in social relations with other people, shaped by work policies and work safety culture, and physical space in which the interactions are taking place.

Safe interactions with dogs requires management of individual emotions and body techniques; co-ordinating own practice with colleagues, family members and relying on members of the public to manage their dogs (e.g. by securing them before opening the doors or being able to recall them in the park). Safety was also improved by the physical design (e.g. external letter boxes or baby gates), and availability of appropriate equipment (e.g.

availability of posting pegs and muzzles). The multiplicity of factors that contribute to safety in encounters with dogs offer multiple opportunities for incremental improvement. This project suggests that current approaches to dog bite prevention could benefit from being re-imagined in three major ways:

1. Risk of dog bites and responsibility for its management are not individual. They are distributed across a network of actors which includes people, dogs and inanimate objects that need to be co-ordinated and appropriately mobilised in the process of negotiating safety. Consequently, it is not enough to change the behaviour of dog owner or bite victim; modifications to all actors have to be considered. This means considering all factors shaping dog behaviour and dog owners' practices, but also practices of breeders, veterinarians and other people who interact with dogs across their lifespan. The environment within which dogs and people interact, as well as equipment used for safety (i.e. the inanimate objects within the network) also has to be considered.

2. At present, dog bites are often considered to be caused by factors immediately preceding it. The temporality of bite risk has to be reassessed: the precursors to a dog bite start long before the actual event and the risk associated with being bitten extends beyond the incident, as a person and a dog may suffer consequences long after. Bite prevention practices should focus on the entirety of dogs' lives, starting with the breeding process. Within this context, policies regulating dog breeding, and socialisation opportunities such as rearing practices and puppy training classes should be considered. Bite prevention efforts need to be extended beyond early-life socialisation and training. This may include socialising dogs as they reach adolescence and social maturity, ongoing training, clear and consistent rules for interactions and addressing health issues, more likely to occur later in dog's life, that could provoke human-directed aggression (e.g. pain, sensory loss). Bite prevention should also be extended to injury reduction, i.e. practices implemented after a bite which could reduce its impact.

3. Risk of being bitten is not assessed objectively and the practices around dogs are not rational. Equally, risk assessment is not subjective or irrational; assessments and related practices are constructed with respect to an individual's embodied, situated knowledge and risk is managed through a range of "in-between" strategies. The role of emotions, intuition, trust and social relations in interactions with dogs and risk management has to be accounted for.

Dog bite prevention measures could be explored systematically by taking the COM-B approach as it offers flexibility to address practices of different actors (Michie et al., 2011) and at multiple levels (e.g. that of a dog owner, bite victim, employee who encounters dogs at work etc.). By focusing on capabilities and motivation, COM-B model enables approaching dog bites from the participants' perspective by incorporating the situated knowledge which shapes their practices (Michie et al., 2011). Emphasis on opportunities offers insights into how "the surrounding material infrastructure, legal, social and power relations [are] central to (…) interventions" (Hargreaves, 2011, p. 95) p. 95). The COM-B model therefore helps to highlight factors other than factual knowledge and tools additional to education which could aid bite prevention and injury reduction. Suggestion on applying COM-B approach in order to modify 4 areas will be offered here:

- Perceptions of dog owners and other people who interact with dogs
- Work systems
- Dogs
- Environments.

10.5.1 Improving dog owners' response-ability

This research highlighted that changing dog owners' behaviour is hindered by an inability to anticipate how a dog may behave in different contexts (due to having a bond with a dog and seeing dog behaviour as a reflection of a dog's character, rather than context-specific) and poor handling skills. Training of dog owners focused on development of "anticipatory knowledge" and handling skills could help owners to be more response-able (Brown and Dilley, 2012) by addressing their physical capabilities. Specifically, the fundamental skill that owners often lack is ability to recall their dog. While subsidised classes could be helpful, free

online and face-to-face dog classes have high dropout rates, particularly in socio-economically disadvantaged communities (Harris et al., 2019). Other methods of incentivising owners to attend (such as rewards or discounts for other services for those who have attended, improving class accessibility by making them child-friendly or providing childcare during the class, being part of a legal framework in being able to own a dog) could also be considered.

Realistically however, many dog owners will not be able to teach their dogs basic commands, including recall. Response-able dog practice could be promoted by providing dog owners with long lines, so that they can safely let off young or boisterous dogs with a means of getting them back if needs be. Likewise, subsidised or free suitable harnesses and head-halters and muzzles could assist owners to be in greater control of dogs when on a short lead. Local animal-welfare charities could consider setting up try-before-you-buy or long-term rentals of such equipment, which could make these more accessible but also provide a chance to show owners how to use them appropriately.

To address a dog owner's motivation to engage in a range of safe practices around dogs, perceptions of these practices and social norms regarding use of equipment, such as muzzles and long lines, need to be addressed. For example, some participants believed that muzzling dogs has a negative impact on their welfare by restricting their ability to play or defend themselves (however, whether this is true requires further investigation). In addition, owners were ashamed of their dogs being aggressive and did not want this behaviour to be visible to others – muzzling dogs could lead to this interpretation. Research also shows that dog owners enjoy watching their dog "being a dog" and running around when out on the walk (Westgarth et al., 2017), thus leads could be seen as limiting dogs' freedom and dog owners' enjoyment. These perceptions could be addressed by modelling use of long lines and muzzles e.g. by using images of dogs with this equipment in dog rescue campaigns; encouraging high profile public figures to discuss them and use them and by recruiting local champions who use them. Jointly, these strategies could aide developing a clear definition of responsible dog-ownership, centred on specific behaviours.

10.5.2 Addressing perception: portraying dog bites as preventable

Some participants thought that bites are not preventable and that little can be done to improve safety. Identifying oneself as having low self-efficacy to address dog behaviour

problems reflects owners' poor psychological capability to implement changes needed to manage dogs. A multi-prong approach is required to, firstly, address the perception that bites are not preventable, and secondly show how to seek help and, thirdly, normalise help-seeking and make it convenient. This could be approached through a marketing campaign based on case studies which illustrate realistically how challenging behaviour of dogs can be managed (e.g. through a series of articles in widely-read newspapers, or by featuring it as a plot line in a TV drama). Further resources on how to seek help should be developed. For instance, a central online hub with reward-based first-aid behaviour advice for common dog behaviour problems and simple training videos should be developed. This hub could also feature a decision-making quiz to help dog owners decide when and to seek professional help and offer contact details of qualified behaviourists and dog trainers. In parallel, to improve the process of help-seeking and credibility of the industry, dog training and behaviour counselling should become a legally regulated industry. Marketing campaigns normalising the use of equipment could also help to change negative connotations of seeking help for dog behaviour problems and portray it as a part of responsible dog ownership.

10.5.3 Addressing perceptions: showing bites could happen to you

Trusting dogs often contributed to participants' optimism regarding how a dog will act and led to a belief that bites happen to other people or that their dog "is fine" and would not bite. These beliefs contributed to justifying not taking safety precautions around dogs. A multi-faceted approach which can address this perception and illustrate the complex reasons for bites and model practices dog owners should adopt is needed. Narrative accounts of dog owners describing circumstances in which their dog bit someone, with a particular focus on the behaviour being context-specific (rather than dependent on the breed) could be trialled for this purpose, as it has a potential to help dog owners relate to the story and address the perception that their dog would not bite. These narratives should also include a description of how an owner sought help afterwards in order to be congruent with the previously suggested campaign. The study suggests that safety practices that should be encouraged and normalised include: securing the dog before opening the doors for a delivery; installing external letter boxes, supervising children when with a dog; installing baby gates to separate children or other vulnerable members of the family from dogs when not supervised (and even

when supervised), and; greater control over dogs when in uncertain or new environments (e.g. by keeping them on the lead or by muzzling them). Again, portraying these practices in visual media could help normalising them and including them as a part of a clear definition of responsible dog ownership. Parents' capabilities to supervise children could be improved through practical skills training incorporated into regular hospital pre- and post-natal checks rather than a one-off leaflet when being released from a hospital, or as a part of parent group activities.

Within this context, it is crucial to further explore both how caregivers understand supervising children around dogs and how dog owners understand supervising dogs and offer best practice guidelines. These guidelines should be based on a definition of a supervision as "behaviors that index attention (e.g. watching and listening) in interaction with those that reflect state of readiness to intervene (e.g. touching/within arm's reach/beyond arm's reach), with both types of behaviours judged over time to index continuity in attention and proximity (constant/intermittent/not at all)" (Morrongiello, 2005, p. 538). Therefore, for example, in the context of interactions between young children and dogs, appropriate supervision should be seen as watching the child and the dog, being able to reach both of them constantly (and perhaps keeping them separate when these conditions cannot be met). Supervising a dog on the walk should mean watching the dog and being aware of its body language and being able to touch the dog (either by keeping them on the lead or by being able to recall them) at all times.

Use of narratives which describes how a dog bit a person could also serve an additional purpose of addressing moralistic views regarding bites, i.e. seeing bites as a lesson or blaming dog bite victims or owners for bites. A narrative could highlight the range of factors which contribute to a bite in a given moment, helping to lift the blame from a single person. Blaming individuals for bites could also be addressed through work policies (outlined in Chapter 6).

10.5.4 Addressing perception that risk of bites is breed-specific

This research demonstrates that there is a strong belief that only some dogs can bite, and that risk posed by dog is determined by its breed, rather than context of interactions and a dog's history. Breed specific legislation is likely to have fuelled this perception. Given how

ineffective the BSL has been in reducing the number of bites (Creedon and Súilleabháin, 2017, Súilleabháin, 2015, Klaassen et al., 1996), serious consideration should be given to repealing this campaign.

10.5.5 Clarifying what is meant by responsible dog ownership

Further to this, it was shown here and in previous research (Westgarth et al., 2019) that the label of responsible dog ownership is used to judge people's practices around dogs and it does not necessarily mobilise behaviour change. Little agreement exists regarding what being responsible dog owner involves. At present, the term seems to denote the moral character of the owner and a sense of commitment to the dog. The existing legislation (*Dangerous Dogs Act 1991*, 1991) should be updated with clear, explicit behaviour and practice-based definition of responsible dog ownership, based on a number of practices that responsible dog owners are expected to engage in, suggested above. Additionally, commitment to the dog should be defined with respect to safety of others: i.e. a dog owner should only be considered as committed to the dog if the dog does not impinge on another's real or perceived safety, as ultimately, and injury caused by that dog could lead to a dog being euthanised.

10.5.6 Changing work systems

Suggestions of how dog bites could be prevented through changes in work systems were described in Chapters 5 and 6. In short, these strategies rely on: facilitating surveillance of dogs e.g. through training to improve observation skills, but also by accurate records and communication regarding a dogs' presence; consistent definitions of dog hazards; introduction of systems where reporting hazards is convenient and where reporting incidents is blame-free; and recognising how staff work together to prevent dog bites. In addition, specific steps that could improve organisation's return to work policies described in Chapter 9 should be considered and improved risk communication, outlined below.

10.5.1 Risk communication

Surveillance systems are a crucial part of most accident prevention (Towner and Dowswell, 2002) and this analysis shows that many organisations already have some dog surveillance in place (where surveillance involves knowing the location of properties with dogs, or in a kennel

environment knowing about the behaviour of a specific dog). A system which could automatically remind workers of the presence of a dog on the property instead of relying on them checking this information is most likely to be effective. A multi-agency shared database has a potential to improve safety in all occupations where entering private properties is necessary, as some of these professionals visit properties infrequently (e.g. healthcare workers vs. delivery services) and alone may not be able to collect the relevant information regarding presence of a dog. However, changes to the data-sharing legislation or legal agreements may need to be required to enable multi-agency data sharing.

In kennels and veterinary practice, communication based on a redundant design (e.g. summarising what is known and best practice in multiple formats and locations) is preferable. This could include a short summary on the kennel block, colour-coded collars or tags on collars, a folder or tablet with up to date details about the dog that follows the dog if they are moved within the organisation, as well as staff meetings where the behaviour of dogs is discussed.

10.5.2 Dog breeding and dog selling reforms

Several ways for modifying dogs have been briefly described in Chapter 5. In short, dogs could be modified at a level of an individual dog: through training and socialisation, and by changing the population of pets provided to owners through dog breeding and selling legislation. The later could be particularly effective in improving safety around dogs. While behaviour tests for shelter dogs have limited predictive value (due to tests being carried out in highly abnormal environments and by carers who have not known a dog for a long time (Patronek and Bradley, 2016)), assessments of owned dogs conducted by dog owners or carers accurately predicted a range of dog behaviours in the future (Harvey et al., 2017). Valid and reliable questionnaire-based assessments exist for guide dogs (Harvey et al., 2017). Given a strong genetic component of aggressive behaviour in dogs (van der Borg et al., 2017, Duffy et al., 2008, Newman et al., 2017b), eliminating dogs that show anxious or aggressive behaviours from the breeding stock, could improve safety. This policy has been successfully trialled in Holland, where after an introduction of a sociability assessment test, stranger-directed fear and non-social fear in Rottweilers was reduced from 1/3 to 1/6 of the population (van der Borg et al., 2017). These policies could be rolled out and enforced by the UK Kennel Club.

The ban on third-party sale of puppies (where a person purchases a dog not from the breeder or rehoming charity) will come into effect on 6th April 2020 in England (with Wales and Scotland likely to follow in the future) (DEFRA, 2018). This is likely to impact on puppy mill breeding and improve safety in interactions with dogs (as well as dog welfare), as not viewing the parents of a puppy has been linked with greater chances of a dog developing behaviour problems (Westgarth et al., 2012) and compromised dog welfare (McMillan et al., 2011, Sonntag and Overall, 2014). Efforts should be made to ensure this policy is enforced. Stricter penalties for violating dog welfare standards could further aide discouraging illicit puppy breeding.

In 2018, over 300,000 dogs were imported to the UK using the Pet Travel Scheme (Dogs Trust, 2018), a legislation which aimed to facilitate ease of travelling with pets within the European Union, and introduced in 2012 (Dogs Trust, 2019). It has been suggested that, due to poor enforcement and lack of penalties for not having the correct paperwork, PETS enables illegal transport and sale of dogs, and a large proportion of these dogs were puppies bred in puppy mills in Eastern Europe (Dogs Trust, 2019). Evidence of widespread falsifications of travel documents and vaccination cards exist (Dogs Trust, 2019). As a result, dogs entering the UK in this way are likely to develop behaviour problems in the future due to lack of socialisation, arduous journey (often in excess of 1200 miles) at a very young age and poor health (due to lack of vaccination and other preventative health measures). Consequently, a legislation which aims to strictly control puppy transport and deter illegal import is urgently needed. This could include a complete ban on import of dogs under 6 months to the UK and an introduction of substantial fines for illegal import with high chances of being caught, which would reduce profitability of puppy smuggling (for further recommendations regarding puppy smuggling, please see: Dogs Trust, 2019).

10.5.3 Lifelong bite prevention

While policy changes that lead to supply of safer dogs described in section 10.5.2 are crucial, dog bite prevention should evolve with dog's life stage. In Chapter 5, the importance of attending puppy classes and early socialisation in reducing the risk of dog showing human-directed aggression and general fear later in life (González-Martínez et al., 2019, Lord et al.,

2017) was discussed. Evidence suggests that around the period of adolescence (between 5-12 months, depending on the bread), dog behaviour often becomes more challenging, and many previously learnt skills deteriorate (Asher et al., 2020). This may coalesce with the timing of the secondary sensitivity period, i.e. period of heightened sensitivity to fear arousing stimuli observed around the age of 6 months (this may occur later in larger breeds). Ongoing socialisation and training during this period and until dog reaches social maturity (around 12-24 months depending on the breed (Harvey, 2019)) is vital.

In addition, throughout dogs' life, efforts should be made to increase predictability and control and to reduce uncertainty in dog's life, as these factors negatively affect animals' welfare (Bassett and Buchanan-Smith, 2007) and are likely to add to the risk of dog bites. In this context, developing and adhering to consistent and predictable 'house' and 'interaction rules' throughout the dog's life could be helpful. These could include, for example, providing a dog a place within the house where they are not disturbed, agreeing consistent rules on where a dog is expected to sleep in the house, offering dogs a choice whether they want to meet new people, etc. (Boivin et al., 2003, Lindsay, 2013).

At any point of their life and in particular, when elderly, dogs may be experience pain and sensory loss or other health issues affecting their behaviours. Pain is frequently associated with human-directed aggression (Barcelos et al., 2015, Mills et al., 2020, Affenzeller et al., 2017), therefore efforts should be made to educate owners in recognising signs of pain. Pain should be managed appropriately through analgesics and by modifying the environment and interactions with a dog to avoid pain-inducing contexts, as even when pain is managed, previous experience of sensing it in a particular context could affect dog behaviour. This could be done by for example, mapping daily interactions with a dog with a veterinary practitioner, identifying those that are likely to induce pain, and developing substitutes (e.g. swapping lifting a dog to providing a dog with a ramp to walk into a car, avoiding kissing or hugging a dog with dental pain etc.). Similar approach could be taken to managing other health issues and understanding contexts in which dogs' sensory loss may impact on their behaviour. These approaches are summarised in Figure 10.2.

Before bringing dog home

- **Dog breeding regulation:** breeding for temperament; strict penalties for back-street breeding, unlicensed breeding and puppy-mill breeding.
- **Dog sales regulation:** enforcing ban on 3rd party sales of puppies; strict regulation on import of puppies from abroad; steep and enforced penalties for puppy smuggling; owner education, Puppy Contract & owner buys/ adopts a dog for their lifestyle.

Puppyhood (0-6months)

Primary socialisation & training: puppy classess etc., setting up clear rules for interactions with other dogs and people and consistent home rules that will be followed throughout dog's life.

Adolescence (~5-9 months, depending on the breed)

Preventative healthcare: vaccinations, flea & worming treatment, consider neutering)

Socialisation & training: managing deterioration of behaviour during adolescence and secondary socialisation during the second phase of heightened sensitivity to fear

Adult dogs (~12+ months, depending on the breed)

Maintaining the established routine & clear, predictable rules

Ongoing provision of healthcare

Socialisation & training: ongoing socialisation with dogs, people and in response to dog's current needs and experiences (e.g. introducing dog to other pets/ children); practicing known commands.

Professional behavioural help (if needed)

Senior dogs (~7-10+ years, depending on the breed)

Geriatric healthcare: recognising & managing pain, degenerative and long-term conditions

Impact of aging: awarness and management of potential cognitive decline, sensory loss, mobility issues etc.

Maintaining the established routine & clear, predictable rules

Socialisation & training

Ongoing socialisation & training

Figure 10.2. Schematic representation of matching dog bite prevention practices with the key stages of dog's life.

10.5.4 Modifying the environment

The physical environment in which interactions with dogs take place has been discussed as a barrier to, as well as an enabler of, safe interactions with dogs. For example, dog shelter workers discussed how shelter space can work "against them", in particular confined spaces (such as corridors, doorways) and spaces where conflict with a dog is more likely (e.g. kitchen where food is prepared due to potential for resource-aggression) were discussed as high risk. Public spaces, such as dog-friendly pubs with a high-density of tables; parks where dogs are likely to be off lead; and open-plan neighbourhoods where dogs, if let out, can wander off far from the house, were equally seen as dangerous. When planning public space, consideration should be given to how dog owners and members of the public will interact. As not all members of the public want to encounter dogs, dogs may need to be excluded from some areas of parks for example. However, as dog owners are also members of the public, these should not be areas of exclusive use, e.g. parks may be safer if they included picnic areas where dogs are not allowed, but they should also include picnic areas where dogs can be taken. Modifying public space for safety has been considered in Chapter 8 and environmental modifications which could improve safety at work (e.g. changes to kennel design, legislation regulating height of a letter box and promoting installation of external letter boxes) were described in Chapter 6. Domestic space could also be made safer. To prevent a dog's access to front doors and to separate dogs from children when unsupervised, baby gates could be used. Consideration should be given to providing these tools free of charge or at a discount, especially in areas with high prevalence of dogs and dog bites, as costs of equipment could be prohibitive for some people.

As human behaviour change is complex, a single intervention is highly unlikely to improve safety of people around dogs. Historical focus on education and breed specific legislation as means to reducing risk have not addressed the actual barriers faced by people when interacting with dogs such as: trusting dogs; affinity towards dogs; social norms regarding dog keeping; physical ability to handle dogs; and the environment in which interactions take place. Historically, the most successful health interventions were based on a layered approach,

which involves numerous actors, as only through this kind of intervention the culture of safety can change (Hemenway, 2009). Consequently, a multi-pronged approach is suggested which aims to address the behaviour of different actors and the barriers they face to negotiating safety, as identified in the course of this research.

10.6 Reflections on research ethics

Discussing dog bites is a potentially traumatic experience and I expected that some participants may be distressed re-telling what happened. However, during the fieldwork, I found out that participants were comfortable talking about their experiences and were often relieved to be able to share them. They were however upset talking about bites to their dogs or other dogs and recalling having their dog euthanised or a possibility of having to do so. Some shelter workers were moved when talking about how their job gives them a chance to protect dogs and give dogs another chance in life. When participants were distressed, I paused the interview and did not take notes on the conversation, reassured participants and asked if they wish to continue. Seeing what subjects brought up strong emotions guided my analysis and helped me to understand how perception of who and what is an object of risk and risk object changes and guides individual actions, as discussed above in 10.3.2.

In addition, interviewing participants about dog bites and watching videos of bites online exposed me to a number of traumatic and graphic images and videos of injury. I coped with these by ensuring that I do have positive experiences with dogs and frequently discussing my feelings with my supervision team. Nonetheless, this has changed my interactions with dogs by making me more cautious and readily imagining a dog bite in contexts where prior to this study I would feel safe. Changes in my perception and experience with dogs informed by this research contributed to the analysis and recommendations presented here.

10.7 Strengths, limitations and future work

This study has a number of strengths, including data triangulation and rigour developed by exploring multiple fieldwork sites, and sampling which enabled exploring multiplicity of experiences. The research is however limited by focusing on specific geographic region, short

duration of fieldwork and my own positionality, which may have affected rapport with research participants. Strength, limitations and suggestions for future work are discussed further below.

10.7.1 Data triangulation and developing rigour of the study

In this research, dog bites were explored through the application of multiple research methods, which contributed to the rigour of findings. For instance, work procedures for managing safety around dogs were explored: 1) from analysis of the legislative perspective; 2) during the fieldwork with the national health and safety regulator; 3) through employers RIDDOR reports of incidents; 4) through participant-observations in different work places; and 5) through qualitative in-depth interviews and focus groups. Taking an ethnographic approach also enabled an analysis of perceptions *as well as* observations of practices and behaviours around dogs, which in turn aided in formulating specific questions regarding these practices during the interviews and focus group discussions. This enabled analysis of the differences between what participants described what they were doing and what they actually did. For example, participants expressed a belief that reporting dog bites and risk posed by dogs is really important at work to protect colleagues from harm and to mobilise relevant behavioural support for the dog. However, when a dog bit them at work, they often did not report it, out of fear of diminishing dog's future chances of rehoming. In some cases, bites were observed that were redefined as not bites.

10.7.2 Sampling to capture diversity of experiences

A further strength of this study was using purposive sampling to recruit participants who had very different experiences with dogs, dog bites, diverse approaches to managing safety, and who experienced a range of socio-economic circumstances. Participants also worked in a range of occupations and interacted with dogs in different contexts, which helped to illustrate how occupation shapes experience of risk and dog-related safety practices. Although the study was primarily located within Merseyside, and transferability may be limited by this, it helped to contextualise the study due to shared understanding of the geography of the region. For instance, delivery workers and dog owners discussed areas they believed were high risk. Due to the nature of being primarily a qualitative study, there is no expectation that the research findings will be directly extrapolated to a broader population, as the findings are

shaped by the beliefs and experiences of the participants and the positionality of the researcher within the specific research context. Public health campaigns are most effective when they are specific (Maibach et al., 2011, Flynn et al., 2007) and thus the findings should be helpful to address dog bites in Merseyside in particular.

10.7.3 Concurrent data collection and theory-driven analysis

A further strength of this research is its theoretical grounding in sociological and psychological theories of risk, which helped to develop a nuanced understanding of dog bites. In particular, using Douglas' socio-cultural theory (Douglas and Wildavsky, 1983, Douglas, 2013) helped to make sense of reasons why participants identified different risks in relation to dogs. Approaching dog bites from the perspective of those who were bitten or who face the risk of bites on a regular basis also helped to show that dog bite risk is experienced long after a bite and it allowed capture of a range of complexities that shape perceptions and experiences. Relying on the symbolic-interactionist approach enabled identifying a complexity of factors participants drew on to identify risk in interactions with dogs and helped to understand the limits of "formal-rational" risk approach (Veltkamp and Brown, 2016) entailed in education approaches. This study was also novel in using models of incident prevention, injury reduction and models of human behaviour change in the context of dog bites. This in particular helped to identify multiple layers of bite prevention and illustrate that even when bites cannot be prevented, injuries caused by them could still be reduced though actions taken after a bite.

10.7.4 Limits of fieldwork

This study is not without its limitations. Recruitment of participants for the qualitative parts of this piece of research was limited to the North-West of the UK. However, the findings resonate with other research, conducted elsewhere, which makes the findings likely to be widely applicable (e.g. Orritt et al., 2015, Sanders, 1990, Creedon and Súilleabháin, 2017). In addition, Chapter 5 was based on RIDDOR database which is national, and Chapter 4 was based on YouTube comments contributed by international viewers, which further corroborates the findings. The ethnographic fieldwork was conducted across multiple sites, which adds a comparative perspective, but also means that none of the fieldwork periods

were particularly long. The ethnographic observations at each site and in particular within the delivery companies, were also shaped by the presence of the gate keeper. This meant that the interview subjects were identified with their help and may not have shared their views regarding their workplace and bite prevention honestly. This was mitigated by a number of days of participant-observations without the gate-keepers' presence, and also inclusion of focus groups with a number of participants who compared views and experiences with each other during the discussion.

In addition, different methods of interviewing (e.g. face-to-face, interviewing while walking a dog, over the phone or skype) used here generated different quality of data. Whilst phone interviews allowed to learn about the experiences of participants who otherwise would not be able to take part in this study, this mode of interviewing made it hard to develop a thorough rapport and lengthy explanations. By contrast, the interviews conducted while walking a dog, encouraged clarifying questions where a discrepancy between participant's described practiced and embodied practice was seen, leading to richer data.

10.7.5 Rapport with participant

My own positionality as a researcher has also shaped the research process and the researcher-research participants power balance. In both shelters and the delivery companies my positionality may have affected rapport with the participants. For instance, as a part of quality checks, participants in the delivery companies were used to being shadowed at work by their supervisors who aimed to establish adherence to procedures. They described this process as stressful and worried that participant-observations will be used to create reports on their practice to managers. This fear was partially addressed by learning about organisational politics and positioning myself as not a member of staff, and by provision of clear participant information sheets describing the purpose of the study and my role. In this way, I have reinforced my position of an outsider, which encouraged my participants to speak freely. Participants from dog shelters who were aware of my background in clinical behaviour perceived me as an insider and as a result, at times appeared confused by me asking questions about the reasons behind their comments or actions, as they assumed that I should already know the answer. Other participants could have been worried that I was assessing or otherwise scrutinising their dog handling skills. This was addressed by not disclosing my

background to participants unless asked about it. I also continued to reiterate that I want to learn from them, to make sure that I do not impose my explanations onto their practices. Some interactions with dogs could have also been affected by my presence; dogs may have responded differently as I was unfamiliar to them which could have led to participants engaging in unusual practices.

Moreover, my background in Clinical Animal Behaviour contributed to how the data were coded. To mitigate that, data-coding was frequently discussed with the supervision team and a number of double-coding sessions were organised, which further contributes to the rigour of this research and aide negotiating insider-outsider balance.

10.7.6 Identifying a range of experiences

As dog bites are stigmatised, owners of biting dogs may not have volunteered for this study due to concerns about being judged. In addition, as participation in this study was voluntary, inevitably, participants who did not wish to share their experiences (potentially due to related trauma or embarrassment), were not recruited and their experiences are not represented here. I attempted to address this by widespread recruitment through posters and leaflets in a broad range of locations. In addition, while participants interviewed within the occupational contexts came from a range of socio-economic backgrounds, recruitment of participants from lower socio-economic backgrounds outside of the work context was challenging. It would therefore be difficult to draw conclusions from their accounts about how socio-economic background shapes safety practices, which was originally one of the research objectives. Participants commented on their perception that dog owners in poor areas more often keep dangerous dogs or keep dogs for personal protection, but this was not observed during fieldwork or in first-person accounts of experiences. Participants did however mention that due to low income their recreational activities were often dependent on public space where they cannot control encounters with dogs (Chapter 9), thus illustrating one potential way in which dog bites are higher within lower socio-economic demographics (Winter, 2015). In addition, participants working in dog shelters spoke about returning to work as quickly as they could, as after one month their sick leave was not paid and they worried about loss of income (Chapter 9). This may have further exacerbated the impact of a bite on their mental health,

but it does not show how low socio-economic status could influence the experience of a bite. Further work is therefore needed to identify what factors linked with lower socio-economic background may contribute to the higher likelihood of dog bites and impact of dog bites.

10.7.7 Future work

A range of harmful perceptions, social norms and problematic practices were identified here and behaviour change approaches to addressing these were suggested. The efficaciousness of these should be formally assessed and evaluated. For example, the role of modifying the environment and equipment in reduction of dog bites should be evaluated. This could be done by developing clinical trials within organisations to evaluate if an introduction of environmental changes results in a reduction in number of bites to staff over a period of time. Further research is also needed to find out how dogs interact with public spaces and how it could be modified to encouraged safe practices of dog owners (e.g. recalling dogs to owners or using long lines). Previous research into hostile architecture - i.e. pieces of public space design that prevent particular behaviours deemed undesirable (such as sleeping on the bench), has shown that use of design can affect a range of human behaviour. For example, the Camden bench is described as designed to discourage 30 different anti-social behaviours, including skateboarding, sleeping, and even theft (Savic and Savicic, 2014). Analogous environmental and design features could be used to encourage safe behaviour and positive interactions with dogs.

Participants discussed that emotional regulation helps them to negotiate safety. However, it is unclear whether being able to avoid showing fear affects behaviour of dogs. Future work could explore this experimentally (e.g. by exposing dogs to scents linked with fear while the actor acts calmly). In addition, the role of mindfulness and structured approaches to improving individual's ability to manage their emotions and dogmanship could be explored. The most efficacious way of teaching handling and management skills still needs to be explored.

In addition, a range of different perceptions around dogs were highlighted and it was suggested that some of these views lead to greater risk taking (e.g. a belief that this will not happen to me, or a strong sense of trust in one's own dog). The relationship between

perceptions of risk, relationship with dogs and bite history could be further explored using questionnaires. For example, previously validated instruments assessing individual propensity to take risk (such as DOSPERT (Blais and Weber, 2006) or RPS (Meertens and Lion, 2008)) , personality inventories (such as IPIP 50 (Johnson, 2014) or one of its shorter versions, such as TIPI (Gosling et al., 2003)), and attachments to dogs (e.g. Pet Attachment Questionnaire (Zilcha-Mano et al., 2011)), alongside brief questions regarding bite history could be used. Future efforts should therefore concentrate on developing typologies of people interacting with dogs on the basis of their relationships with and perceptions of dogs and risk. These could then be used to target specific interventions more appropriately.

Furthermore, it was identified here that dog bites did impact on the mental health of some, but not other participants. Future work should explore if individual resilience could be improved before a bite. In addition, best practice for supporting bite victims suffering from related mental health problems should be explored. Changes in work systems, and especially the effect of return to work policies on workers' wellbeing, also needs to be evaluated, ideally through work-based research. Finally, to access rich data, future work could benefit from more interviews whilst walking.

10.8 Conclusion

Managing risk is a part of human-dog interactions. Risk was identified and managed through a range of "in-between" strategies (Zinn, 2008). These included: reliance on policies and routines, trust, intuition and emotions. These methods were helpful in preventing dog bites but none of them were fool proof. They did however help people feel safer, as they alleviated feelings of uncertainty linked with every-day risk management. Negotiating safety required careful balancing between these approaches, as if used in wrong contexts, they were seen to increase, rather than reduce, the risk of a bite. The feeling of safety these methods engender was also a barrier to preventing bites through alternative approaches (e.g. if own method of preventing bite made one feel safe, they were reluctant to adhere to work policies), which may be more effective.

Risk and responsibility for its management were often attributed to an individual. The individual was perceived as a risk object and change of individual behaviour was seen as

needed to maintain safety around dogs. However, the practices required for this relied on social relations, co-operation between colleagues, family members and co-ordination of a whole network of actors needed to prevent bites. Neglecting this social, co-produced nature of safety hindered dog bite prevention. Individualisation of risk also contributed to stigmatisation of dog bites, which further affected practices around safety. Successful dog bite prevention requires not just education or change in legislation, but subtle changes throughout the whole network required to bring safety; addressing how dogs are managed and bred, training throughout their life, changing owner's perceptions, knowledge and skills, modifying workplace policies and changing the physical environment.

Furthermore, some of the causes of dog bites begin long before the actual bite. Effects of dog bites also lasted long after the event in the form of trauma. Some participants did not see the risk of bites as covering such a long period of time and often thought of a risk as occurring in a given moment, e.g. they thought that bites were not preventable because they could not understand what they could have done in that moment to provoke it (without realising how a dog's or their own past experiences may have contributed to the event). Changes in the perception of the temporality of dog bite risk is therefore also required for more effective dog bite prevention.

While previous research and legislation typically focus exclusively on preventing the actual bite incident, this study shows that more could be done to reduce the extent of physical injuries and adverse effect of dog bites on mental health after a bite occurs. In other words, while dog bites cannot always be prevented, their impact could be feasibly reduced through provision of muzzles and other equipment which could prevent a serious injuries, as well as return to work policies, mental health support, and hospital care pathways which could reduce the long-term damage to the injured person.

Human-dog relationships are complex: dogs are treated like animals, but also as members of the family, and commodities. These complex relations mean that the way people bond with dogs and the basis of relationships with dogs are also multi-faceted. The challenge of preventing dog bites at a population level is addressing the multitude of encounters and relationships people have with dogs. In addition, what helps us bond with dogs, and ultimately brings enjoyment to dog ownership - comfort of routine interactions, trusting dogs and believing they will behave the same way as usual, and a strong affect for dogs - also introduce

risk to human dog interactions. Popular approaches to bite prevention rely on education. This approach is limited as it overlooks the way relationships with dogs, emotions towards dogs, relationships with dog owners, work policies, and a broader work environment, as well as routines, physical abilities and aspects of the physical space, all shape outcomes of interactions between a dog and a person. In other words, individual positionality and situated knowledge shapes how they interact with dogs and how to cope with bites, and education is just one small part of this knowledge.

Nonetheless, this study suggests that education is still an important part of dog bite prevention strategy. It has also shown that education into dogs' body language may be more effective as a tool for preventing bites where people need to handle dogs, such as in veterinary work or in dog shelters. This approach is less successful in other contexts, such as delivery work, where a bite victim often does not see a dog prior to a bite. However, instead (or perhaps in addition to) of teaching only about dogs' body language, education should focus on addressing misconceptions about trust, and tackle optimistic, pessimistic and moralistic perceptions of bite prevention, thus contributing to a shift in social norm regarding dog ownership and safety culture.

To improve dog safety culture, a multi-layered approach that helps to prevent bites and reduce the injury created by bites is clearly needed, as "people are people and they make mistakes (…) [At heart],public health is all about creating a world where it's difficult to make mistakes and if you make mistakes, nobody dies, instead of just trying to say be good, watch out" (Hemenway, 2018)

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Appendix 1

Table. 1. Summary of information about participants who were interviewed.

Participant name	Age		Other details
1. Hannah	30-40	Dog owner	Recently bitten by own dog. Bite to the face, bite described as significant.
2. Eve	40-50	Non-owner	Bitten by a stranger's dog. Bite occurred over 10 years ago. Bite to Eve's leg, described as not severe.
3. Philip	20-30	Non-owner	Bitten by a stranger's dog. Bite occurred over 3 years ago. Bite to the leg, described as not severe
4. Carol and 5. John	70+	owner	Carol was bitten by her own dog in the face and leg, bite required hospitalisation. Bite occurred over 3 years ago. Less serious bites were described as constant, most recent one a week before the interview. The same dog bit two other people (4 and 5 years previously), both

			bites required hospitalisation. John was never seriously bitten by their dog.
6. Patricia	30-40	owner	Never bitten, 3 dogs, one of which bitten other people. Most recent bite 4 years ago. Bite did not require hospitalisation but was reported to the police.
7. Chris	30-40	owner	Bitten 3 times, on the leg and arms by strangers' dogs while at work (works as an engineer in a utilities company). Most recent bite1 year ago. Bite wounds were cleaned and dressed in the hospital.
8. Simon	60-70	non-owner	Bitten by a stranger's dogs on the arm while running 2 years ago and 4 years ago. Bites did not require hospitalisation. Bites were reported to the police.
9. Alice	40-50	Non-owner	Bitten by a stranger's dog on the hand and buttocks (2 and 1 years ago). Her disabled son was also bitten by a dog (1 year ago). None of the bites required hospitalisation.
10. Clara	30-40	Dog owner	Her daughter (a toddler) was bitten by her brother's dog on the face 3 years ago. Bite was cleaned and dressed at the hospital.
11. Melisa	20-30	Dog owner	Never bitten, her dog bit three people. The most recent bite occurred 4 years ago. Bites were cleaned and dressed at the hospital.
12. Mike	40-50	Dog owner	Never bitten, his dogs never bitten a person, but did attack sheep and kill seagulls.
13. Ely	40-50	Non owner	Bitten by a dog on the face more than 30 years ago. Bite required hospital admission.
14. Nina	40-50	Non owner	Bitten by family pet as a child (over 30 years ago) bite did not require hospitalisation
15. Anna	30-40	Dog owner	Own dog bit 3 children (all bites to the arm). Bites did not require hospital admission and occurred 3-1 years ago. Bitten by her own dog (arms, legs)- bites did not require hospital treatment. The most recent bite occured a few days before the interview. Bitten by strangers' dog 6 years ago- bite was cleaned and dressed in the hospital.
16. Beatrice	20-30	Dog owner	Bitten on the face by a family pet dog more than 10 years ago. Owns a dog that has never bitten.
17. Luke	30-40	Dog owner	Bitten by a stranger's dog less than a year ago, bite was cleaned and dressed at the hospital. Owns a dog that has never bitten anyone.
18. Becky	20-30	Dog owner	Bitten by neighbour's and stranger's dog less than 3 years ago. Both bites were cleaned and dressed in the hospital. Her own dog has never bitten.
19. Juli	70+	Dog owner	Bitten by a stranger's dog whilst at work (worked as a healthcare professional within a community), more than

			20 years ago. Bite was cleaned and dressed at the hospital. Her own dogs have never bitten.
20. Harry	50-60	Dog owner	Bitten by stranger's dog as a child. Harry recently started his own dog walking business. A dog he is walking has nearly bitten a child and an adult whilst in his care (less than a month before the interview).
21. Sean, 22. Thomas, 23. Jack	40-50, 0-10, 10-20	Non owner	Never bitten; his son (Thomas) was bitten when he was 5 by a stranger's dog. Bite was cleaned and dressed in the hospital.
24. Casey	20-30	Dog owner	Bitten by her own dog in the past, did not consider the bite as serious. Bite occurred a few years before the interview. Bitten by sister's partner dog: deep puncture wounds to the breast and leg, did not seek hospital treatment.
25. Maya	20-30	Dog owner	Bitten by her own dogs twice (arm and leg). The second bite occurred less than a month before the interview. All bites were cleaned and dressed in the hospital. One of the dogs also bit a stranger. This bite did not require hospital treatment.
26. Irene	30-40	Non owner	Her child was bitten by her own dog (bite to the face) 5 years prior to the interview. Bite required hospital treatment.
27. Nora	30-40	Dog owner	Bitten by her own dog in the past (more than 10 years ago), bite described as not serious. Bitten by a stranger's dog less than a year before the interview. This bite required hospital admission.
28. Lisa	60-70	Dog owner	Bitten by her own dog 3 years ago. The bite required hospital treatment. Her own dog bit 5 people before she acquired him.
29. Tom	20-30	Dog owner	Bitten by a stranger's dog when he was 12. Bite required lengthy hospitalisation. His own dog has never bitten.
30. Peter	60-70	Dog owner	Never bitten. His own dog bit his neighbour less than a year ago. Bite required hospitalisation.
31. Louise	10-20	Non owner	Works in a Dog Shelter, never bitten
32. Sarah	30-40	Dog owner	Works in a Dog Shelter, never bitten
33. Rosie	30-40	Dog owner	Works in a Dog Shelter, never bitten

34. Isabel	20-30	Dog owner	Bitten by her own dog 3 years ago (hand), required hospital cleaning. Bitten at work (2 years ago), required hospital cleaning. Works in a Dog Shelter.
35. George	20-30	Non owner	Bitten at work and in previous work (2 and 4 years ago, both times bites to the hand). Bites required hospital treatment. Works in a Dog Shelter.
36. Joanne	30-40	Dog owner	Works in a Dog Shelter, never bitten
37. Kerry	20-30	Non owner	Works in a Dog Shelter, bitten at work twice (1 and 3 years ago). Both bites to the hand and both required hospital treatment.
38. Mary	40-50	Dog owner	Works in a Dog Shelter, bitten at work once. Bite to the hand. Bite required lengthy hospitalisation. Her own dog has never bitten.
39. Clair	30-40	Non owner	Veterinary nurse, bitten at work, 2 years ago. Bite to the hand, bite required lengthy hospitalisation.
40. Donna	30-40	Dog owner	Bitten at work on the hand, bite required hospital treatment. Bitten 3 years ago. Works as an independent dog behaviourist.
41. Adam	50-60	Non owner	Works for a Delivery Company, bitten at work 3 times. Most recent bite occurred 5 years ago. All bites were treated by a medical professional. Bites to arm and leg.
42. Ella	40-50	Non owner	Works for a Delivery Company, never bitten.
43. Cameron	40-50	Non owner	Works for a Delivery Company, bitten at work 10 years ago, bite required hospitalisation. Bite to the leg.
44. Dan	50-60	Non owner	Works for a Delivery Company, bitten at work 1 month before being interviewed (bite to the leg). Bite did not require hospital treatment.
45. Fliss	20-30	Non Owner	Works for a Delivery Company. Bitten at work 1 year before the interview. Bite to the leg. Bite required lengthy hospitalisation.
46. Ben	50-60	Non owner	Works for a Delivery Company. Bitten at work 2 years before the interview. Bite to arm, bite required lengthy hospitalisation.
47. Ed	40-50	Non owner	Works for a Delivery Company, never bitten.
48. Georgia	40-50	Owner	Works for a Delivery Company. Bitten at work 8 years before the interview, bite required hospital treatment. Own dog has never bit anyone, but showed aggression to strangers and other dogs.
49. Harriette	50-60	Non owner	Works for a Delivery Company, bitten at work 30 years ago. Bite required lengthy hospitalisation. Bite to the arm.

50. Frank	40-50	Owner	Works for a Delivery Company, never bitten. Own dog has never bitten anyone.

Appendix 2

Table 1. Remedial actions

Types of risk controls (administrative, individual, group or technical) used.					
Type of control/ articulation of control measures	Veterinary care	Police/Army officers	Dog shelters/kennels/ groomers	Delivery service	All occupations combined
Administrative controls total (n, % of all measures at this level)	28, (50.90)	25, (50.00)	28, (42.42)	12, (52.17)	378, (55.8)
Organisation-wide (%)	78.57	88	64.29	58.33	60.32
At a level of an individual (%)	14.29	12	17.86	41.67	13.23

At a level of a dog (%)	7.14	0	17.86	0	26.46
Individual controls total (n, % of all measures at this level)	5 (9.1)	9 (18.00)	10 (15.15)	1 (4.34)	90, (13.3)
Organisation-wide (%)	100	0	50	100	26.67
At a level of an individual (%)	0	33.33	10	0	57.78
At a level of a dog (%)	0	66.67	40	0	15.56
Group controls total (n, % of all measures at this level)	1, (1.18)	0	0	0	3, (0.4)
Organisation-wide (%)	100	0	0	0	100
Technical controls total (n, % of all measures at this level)	21, (38.18)	16, (32.0)	28, (42.42)	10, (43.48)	207, (30.53)
Organisation-wide (%)	66.67	37.5	64.29	60	38.65
At a level of an individual (%)	9.52	6.25	7.14	10	10.63
At a level of a dog (%)	23.81	56.25	28.57	30	50.72
Total	55	50	66	23	678

LEGEND:

To illustrate difference in their use between occupations, controls are shown for all occupations as well as the 4 most commonly bitten occupations for which the remedial actions were stated (veterinary care, police/ army dog handlers, dog shelters/kennel workers/ groomers and delivery services). Group controls are by definition only on the group level.

Appendix 3

PARTICIPANT CONSENT FORM

Version: V4. 22/03/2017

[points included only for participants recruited through work are marked with *]

Title of Research Project: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (student researcher), Dr Carri Westgarth (principal investigator), Dr Francine Watkins, Dr Rob Christley, Dr Huadong Yang

1. I confirm that I have read and understood the information sheet dated 22/03/17 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw up to two weeks after the interview/ observations without giving any reason and without my rights being affected. In addition, should I not wish to answer any particular question or questions, or take part in a particular part of the study, I am free to decline. ☐

3. I understand that, under the Data Protection Act, I can ask for access to the information I provide and I can also request the destruction of that information if I wish up to two weeks after the interview/observations. ☐

4. I understand and agree that my interviews will be audio recorded. ☐

5. I consent to use of interview recordings for the purpose of transcription by the student researcher and the professional transcribers for the purpose of analysis. ☐

6. I consent to use of quotes from transcripts in the dissemination of the research including published articles, reports, academic presentations, presentations to the members of the public, public facing blog and reports, presentations to the industrial partners (the Royal Mail Group, Dogs Trust and Health and Safety Executive). ☐

7. I consent for the researcher to observe my interactions with my dog(s) during the interview. ☐

Or

7. I consent for the researcher to join me and observe my interactions and encounters with dog(s) during my work activity.* ☐

8. I consent to use of notes from these observation in published articles, reports, academic presentations, presentations to the members of the public, public facing blog, reports and presentations to the industrial partners (the Royal Mail Group, Dogs Trust and Health and Safety Executive). ☐

9. I consent for the anonymised transcripts and observation notes from this study to be stored for 10 years in a research archive so that other researchers can access this data after receiving the permission of the Principal Investigator. ☐

For points 10 and 11, please select <u>one</u> option:

10. I wish for my responses to be kept in strict confidentiality. I would not like for my name to be linked with the research materials and I would not like to be identified or identifiable in the report or reports that result from the research. I give permission for members of the research team to have access to my anonymised responses. ☐

11. I would like to waive my right to anonymity. I would like my name used and to remain identifiable. I consent to use of what I have said the in reports, publications and other research outputs that result from this research. ☐

12. I understand that my confidentiality may be breached if the research team has serious concerns about my and safety or safety of someone else identified by me in the course of the study. ☐

13. I agree to take part in the above study. ☐

Participant name	Date	Signature
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Researcher	Date	Signature
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PARTICIPANT CONSENT FORM

Version: V4. 22/03/2017

[for children joining their parents during the interview]

Title of Research Project: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (student researcher), Dr Carri Westgarth (principal investigator), Dr Francine Watkins, Dr Rob Christley, Dr Huadong Yang

☐

☐

1. I confirm that I have read and understood the information sheet dated 22/03/17 that describes this study. I thought about the information in that sheet and had a chance to ask questions. The researchers were able to answer these questions well.

2. I understand that taking part in this study is voluntary – I don't have to take part and I can say no to it now up to two weeks after I was interviewed/observed. I don't have to give any reason for changing my mind. If I decide not to be in this study and my rights won't be affected. There is no penalty for withdrawing from this study. In addition, if I don't want to answer a particular question or questions, or take part in a particular part of the study, I don't have to.

3. I understand that there is a law (called the Data Protection Act) which allows me to ask to see information about me and what I said during the interview. I can also ask for my interviews to be destroyed so that they won't be used in the study for up to two weeks after my interview/ observations

4. I understand and agree that my interviews will be audio recorded.

5. I agree for my interview to be typed up by Sara Owczarczak-Garstecka and other professional typists. This is because it is easier to read and study interviews that are typed up than audio-recorded.

6. I agree for the researchers to use quotes from the typed up interviews when talking or writing about their research to other researchers or the general public.

7. I agree for Sara Owczarczak-Garstecka to observe how I interact with my dog and ask questions about it.

8. I agree for Sara Owczarczak-Garstecka to make notes during these observations and to use them when talking and writing about dog bites with other researchers or the general public.

9. I understand that the researchers will keep the recordings and typed up interviews private. I understand that the researchers will replace my real name and other details that I give them with made up ones so that no one can identify me.

10. I understand that the typed up interviews with me and notes from observations (with all of my details, including my name deleted and replaced with made up ones) will be stored in a special archive for 10 years so that other researchers can use it in their studies. To use it in their study, the researchers will need a permission form Dr Carri Westgarth.

11. I understand that the researchers may break the promise to keep the information about me private if they are really worried about my safety or safety of someone else that I talk about in the course of the study. ☐

12. I agree to take part in the above study. ☐

Participant name	Date	Signature
---	---	---
Researcher	Date	Signature
---	---	---

Principal Investigator:
Carri Westgarth
Institute of Infection and Global Health
University of Liverpool Leahurst Campus
Chester High Road
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+44 (0)151 795 6029
Carri.Westgarth@liverpool.ac.uk

Student Researcher:
Sara Owczarczak-Garstecka
Institute of Infection and Global Health/
Institute for Risk and Uncertainty
Chadwick Building
University of Liverpool
Liverpool
L69 7Z
s.owczarczak-garstecka@liverpool.ac.uk

PARTICIPANT CONSENT FORM

Version: V4. 22/03/2017

[for parents of children]

Title of Research Project: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (student researcher), Dr Carri Westgarth (principal investigator), Dr Francine Watkins, Dr Rob Christley, Dr Huadong Yang

1. I confirm that I have read and understood the information sheet dated 22/03/17 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my child's participation is voluntary and that I and they are free to withdraw up to two weeks after the interview/ observations without giving any reason and without my rights being affected. In addition, should I or my child not wish to answer any particular question or questions, or take part in a particular part of the study we are both free to decline. ☐

3. I understand that, under the Data Protection Act, I or my child can ask for access to the information we provide and we can also request the destruction of that information if we wish for up to two weeks after the interview/ observations. ☐

4. I understand and agree that my child's contributions to the interview will be audio recorded. ☐

5. I consent to use of interview recordings for the purpose of transcription by the student researcher and the professional transcribers for the purpose of analysis. ☐

6. I consent to use of quotes from transcripts in the dissemination of the research including published articles, reports, academic presentations, presentations to the members of the public, public facing blog and reports, presentations to the industrial partners (the Royal Mail Group, Dogs Trust and Health and Safety Executive). ☐

7. I consent for the researcher to join me and my child and observe my interactions with our dog(s). ☐

8. I consent to use of notes from these observation in published articles, reports, academic presentations, presentations to the members of the public, public facing blog, reports and presentations to the industrial partners (the Royal Mail Group, Dogs Trust and Health and Safety Executive). ☐

9. I consent for the anonymised transcripts and observation notes from this study to be stored for 10 years in a research archive so that other researchers can access this data after receiving the permission of the Principal Investigator. ☐

10. I wish for my and my child's responses to be kept in strict confidentiality. I would not like for my name or my child's name to be linked with the research materials and I would not like to be identified or identifiable in the report or reports that result from the research. I give permission for members of the research team to have access to my anonymised responses. ☐

11. I understand that my confidentiality or the confidentiality of my child may be breached if the research team has serious concerns about my and safety or safety of someone else identified by me in the course of the study. ☐

12. I agree for my child . . . . [name] take part in the above study. ☐

Participant name	Date	Signature
---	---	---
Researcher	Date	Signature
---	---	---

Principal Investigator:
Carri Westgarth
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Appendix 4

Participant Information Sheet

Version: V4. 22/03/2017

Alternative wording used in Participant Information Sheet for participants recruited through work is marked with ** and in red.

Study Title: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (PhD student), Dr Francine Watkins, Dr Rob Christley, Dr Carri Westgarth, and Dr Huadong Yang.

You are invited to take part in a study that aims to understand how you experience and perceive dog bites. This leaflet describes the background of this research and outlines what happens during the interview and the observations. Please take time to read the information on this sheet carefully before deciding to take part in this research. You will have a chance to discuss this information before the interview.

What is the purpose of the study?

Although many of us live happily with and around dogs, the number of hospital admissions due to dog bites is increasing. Knowledge about peoples' understanding of why dog bites occur and what influences people's behaviours around dogs is lacking. This information is crucial, as any tips about bite prevention need to be formulated in a way that makes sense to owners and potential victims and relate to how they see and understand why dogs bite.

Why have I been chosen to take part?

You were invited to take part in this study because we would like to talk to you about your experience of dogs. In particular you may:

1) be a dog owner whose dog has bitten someone (someone else or yourself), or,

2) have been bitten by a dog or have a child who has been bitten,

3) encounter dogs at work or have been bitten by a dog at work.

**

Why have I been chosen to take part?

You were invited to take part in this study because we would like to talk to you about your experience of dogs. In particular you may often meet dogs as a part of your profession and you have or have not been bitten. **

Do I have to take part?

No, your participation is voluntary and you are free to withdraw up to two weeks after the interview/observations without explanation and without incurring a disadvantage.

** **Do I have to take part?**

Although we are working with your employer, your participation in this project is completely voluntary. There are no consequences for you if you don't want to take part and you are free to withdraw up to two weeks after the interview/ observations without explanation and without incurring a disadvantage. **

What will happen if I take part?

If you chose to take part in the study, you will be interviewed by the PhD student -- Sara Owczarczak-Garstecka. The interview will take place on a date convenient for you and the researcher in a mutually agreed location that allows privacy, such as your home. The interviews will be audio-recorded. As for some people dog bites are sensitive subjects, you may find it upsetting to explain what happened to you when you were bitten. If at any point of the interview you are upset or would like to stop to take a break, please inform the researcher. The interview will take 1-3 hours. Before the interview starts, you will have a chance to discuss this information sheet and ask questions. The researcher will then ask for your consent to being interviewed and to audio-recording the interview. After the interview, the researcher will give you a debrief sheet and discuss what happens next.

This study also uses observations -- the researcher may observe and ask questions about your activities with your dog (if you have a dog) during the interview or shortly after the interview to better understand your perspective and context. Throughout observations, please act as you would normally do in relation to other people, dogs and your dog. The researcher will make short notes throughout the observations and interview.

** This study also uses observations -- the researcher may observe and ask questions about your activities at work and join you in these activities for a day. The aim of these observations is to better understand your perspective, context of your work and what you do. The observations do not aim to check whether you adhere to work policies. These observations are confidential, which means that the researcher will not be reporting your practices to your employer without removing details that could be used to identify you. Throughout observations, please act as you would normally do in relation to other people, dogs and your work activities. The researcher will make short notes throughout the observations and interview. **

Cost and reimbursement

The study carries no costs to the participant other than their time. Participation will not be reimbursed or compensated in any way.

What are the possible benefits and risks of taking a part in this study?

There are no direct benefits of the interview or observations to the participants. Information gathered in the process of this interview will further the knowledge on what happens during the dog bite accident and people's perceptions of dog bites. The ultimate objective of this project is that information gathered through this research will be used to improve dog bite prevention.

Although the study subject is perceived neutral, it is possible that the participants will be upset whilst discussing their past experience of dog ownership and dog bites. The participants may also get bitten by their own dog during this study or their dog may bite someone else.

What if I am unhappy or if there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Dr Carri Westgarth on +44 (0)151 795 6029 and we will try to help. If you remain unhappy or

have a complaint which you feel you cannot come to us with then you should contact the Research Governance Officer at ethics@liv.ac.uk or +44 (0) 151 794-8290. When contacting the Research Governance Officer, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

What will happen with the study results and confidentiality?

The interview will be transcribed word for word and analysed for the purpose of the doctoral thesis, scientific publications and public communication, including presentations for the industrial partners of this project (Dogs Trust, the Royal Mail Group and Health and Safety Executive). The interview content will be anonymised by removing participant names, altering locations, changing participant descriptions, information about the dogs and names of organisations linked with participants. If the researcher is concerned that identity of the interviewee cannot be sufficiently protected, the case may not be used in the final publication. Interviewees can also waive their right to anonymity, in which case their real name and circumstances of the bite will be used.

The interview recording and transcript will be kept on a password protected file on the password protected University drive and deleted from the recording device. The anonymised interview transcript will be also stored on password protected file on password protected, encrypted laptop that the researcher uses for the research purposes. The data will be accessible to the student researcher and the supervision team listed on the top of this document. The anonymised data will be archived for 10 years, as per the requirements of the University and will be destroyed with data-destruction software after that. In that time, other researchers will be able to request access to the anonymised data in order to use it for their own research. To do so they will need to seek the permission of Dr Carri Westgarth.

Your confidentiality cannot be assured if in the course of the interviews or observations the researcher has serious concerns relating to your safety or safety of others.

Withdrawing from the study

You are free to withdraw from the study up to two weeks after the interview/observation. It will be difficult after this point to extract your data. If you wish to withdraw from the study, please inform the researcher by contacting her on s.owczarczak-garstecka@liverpool.ac.uk.

Contact for Further Information

If you have any questions, please feel free to contact the Principle Investigator, Dr Carri Westgarth.

Principal Investigator:

Dr Carri Westgarth

Institute of Infection and Global Health
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Student Researcher:
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s.owczarczak-garstecka@liverpool.ac.uk

Carri.Westgarth@liverpool.ac.uk owczarcz@liverpool.ac.uk

Thank you for taking time to read this sheet.

Appendix 5

PARTICIPANT CONSENT FORM (UNDER 16 YEARS)

Version: V4 22/03/2017

Title of Research Project: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (student researcher), Dr Carri Westgarth (principal investigator), Dr Francine Watkins, Dr Rob Christley, Dr Huadong Yang

We are from the University of Liverpool and we are asking you to be in a research study. We do research studies to learn more about how the world works and why people act the way they do. In this study, we want to learn about people's experiences and perceptions of dog bites.

Why are we studying dog bites?

Many people own dogs but unfortunately some people are also bitten by dogs. We want to try and understand why bites happen and see if we can help people prevent them. Bites can change how dog owners interact with their dogs, so it's not just humans who suffer. We don't know what people think about dog bites or what they do to avoid them and this is what we would like to learn from you.

Why am I involved?

We invited your parents to help us with this study because you were bitten by a dog. We will ask other people with a similar experience to yours and that of your parents too.

Do I have to be in this study?

You do not have to participate in this study. It is up to you. You can say no now or you can change your mind up to two weeks after the interview.

What will happen if I take part?

We would like to interview your parents about a dog bite that happened to you. You can join them during this interview if you like and answer some questions. You parent will be interviewed by Sara Owczarczak-Garstecka, who is one of the researchers on the project. The interview will take 1-3 hours and will be audio-recorded. You don't have to join your parents, and you can skip any question if it makes you uncomfortable or if you are just bored. No one will be upset with you and you don't have to tell us why you don't want to take part.

Sara would also like to observe how you and your parents interact with your dog during the interview to learn more about things you do together.

Are there any risks or benefits to me being in this study?

You may find talking about your dog bite upsetting, however you can stop at any time. There are no direct benefits to you for participating in this study. The study will hopefully help us learn more about why people get bitten by dogs and how we could prevent it.

What if I am unhappy or if there is a problem?

If you are unhappy, or if there is a problem, please let your parents know or let us know by telling the researcher Sara or contacting her supervisor Dr Carri Westgarth on +44 (0)151 795 6029 and we will try to help. If you remain unhappy or have a complaint which you feel you cannot come to us with then you should contact the Research Governance Officer at ethics@liv.ac.uk or +44 (0) 151 794-8290.

What will you do with information about me?

We will be very careful to keep the recordings and transcripts of an interview with you private. Before and after the study we will keep all information we collect about you locked up and password protected. We will replace your real name and other details that you give us with made up ones so that no one can identify you.

What if I don't want to do the study anymore?

If you want to stop doing the study, contact Sara Owczarczak-Garstecka on 07676899234 or owczarcz@liverpool.ac.uk. If you decide that you don't want your interview or observations materials in the study after the interview or observations occurred, you can let Sara know up to 2 weeks after the interview/ observations and we will exclude them.

If you have questions about the study, contact:

Principal Investigator:
Carri Westgarth
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Chester High Road
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Student Researcher:
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owczarcz@liverpool.ac.uk

Appendix 6

Debriefing sheet

Version: 1 [17/02/17]

Research Project: Dog bites: Perception and Prevention

Researcher(s): Sara Owczarczak-Garstecka (student researcher), Dr Carri Westgarth (principal investigator), Dr Francine Watkins, Dr Rob Christley, Dr Huadong Yang

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Thank you very much for participating in our research project. Your contribution is valuable to us and will lead to future actions to better prevent and manage dog bite situations.

What if I am experiencing problems related to being bitten by a dog?

If you feel that you would like to contact someone about your dog's behaviour then we recommend that you contact an experienced and qualified dog behaviourist such as a Member of the Association of Pet Behaviour Counsellors or Certified Clinical Animal Behaviourists:

The Association of Pet Behaviour Counsellors

www.apbc.org.uk

PO BOX 46,

Worcester,

WR8 9YS,

England

01386 751151

info@apbc.org.uk

Certified Clinical Animal Behaviourists
http://www.asab.org/ccab-register

If you would like to talk to someone about bereavement and loss of a pet, we recommend that you contact the Pet Bereavement Support Service:

The Pet Bereavement Support Service

0800 096 6606

pbssmail@bluecross.org.uk

If you are finding the experience of being bitten by a dog difficult to cope with, we recommend that you speak with your GP or another suitable Health Care Professional.

Finally, if you have any more questions about the study or at any point in the future wish to discuss the information that you provided, please contact:

Sara Owczarczak-Garstecka

Email: s.owczarczak-garstecka@liverpool.ac.uk

Phone: (0)7525366423

Institute for Infection and Global Health/ Institute for Risk and Uncertainty

Chadwick Building

University of Liverpool

Liverpool L69 7Z

Appendix 7

Interviews Guide for dog bite victims

Narrative Questions- Dog bite victims

I am interested in your experience of being bitten by a dog / your child being bitten by a dog and your ideas about why it might have happened and the impact it has had on you/ and your child. I will ask you about these issues in turn. You are welcome to start wherever feels most comfortable for you and I will also try not to interrupt you.

1. Tell me about a dog you currently have or had in the past (if you have dogs).

Prompts:

- What is she/he like?
- Why do you have a dog?
- Why did you choose this dog?

2. Can you tell me about the time you / your child were bitten by a dog? If this happened more than once, please choose one particular incident to focus on to begin with.

Prompts:

- What was happening before the bite? (the victim, the owner, the dog)
- Why do you think you were bitten? (ask for examples of things that may have caused the bite)

3. Can you tell me about what happened after the bite and what impact, if any, the bite had on you/ your child?

Prompts:

- What was your initial reaction?
- Has anything change for you since you were bitten/ since your child was bitten? What are the things that have changed for you/ your child? Examples
- Has the bite had an impact on your personal life- family, work, relationships? What impact did the bite have? examples
- Has the bite had an impact on your day-to-day life? What impact did it have? Examples
- Has your relationship with your dog changed since the bite? How has it changed? Examples
- Has what you do with your dog changed since the bite? How has it changed? Examples
- Has the bite influenced how you think about yourself as a dog owner? How has it influence how you think of yourself as the dog owner? Examples
- What made the experience of being particularly hard/ What made the experience of being bitten easier?
- Has your understanding of your dog changed after the bite? How? And of dogs in general?
- What else influenced your actions after the bite?

Prompts to use if the participant was bitten a while ago:

- How have the things you describe changed over time? Examples

Areas I'd like to learn more about when asking clarifying questions:

DOG

- What sort of dog was it? Breed, age, sex, time of acquisition, early history of the dog (including training)
- What do you/did you usually do together?

BITE ACCIDENT

- What was happening before the bite? (what were you doing, what was the dog doing, what were other people doing?)
- How did the dog bite you?

- Where were you at the time of the bite?
- When did it happen?
- What was your relationship with the dogs' owner?
- What was the response of the onlookers?
- In what way, if at all, could this bite been avoided?

AFTER THE BITE:

- What did you do? (e.g. Shout/ scream/ cry/ lie down….)
- Who, if anyone, did you contact?
- What happened with the dog? (locked in? reported? Punished? Nothing?)
- How has your relationship with the owner change since the bite?

Interview Guide: Owners of dogs that have bitten

Narrative Questions- Owners of dogs that have bitten.

I am interested in your experiences of your dog biting someone else, the consequence that this had on you and your dog, and your ideas about what happened. I will ask you about these issues in turn. You are welcome to start wherever feels most comfortable for you. I will take notes during the interview and will try not to interrupt you.

1. **Could you tell me a little bit about your dog (the one that has bitten someone)?**

   Prompts:

- What is he/she like?

- Why did you get a dog?
- Why did you get this particular dog?

2. **Can you tell me about the time your dog bit someone? If your dog bit more than once, please choose one particular bite accident.**

   Prompts :

- What was happening before the bite? (the victim, the owner, the dog)
- Why do you think your dog bit? (ask for examples of things that may have caused the bite)

3. **Can you tell me about what happened after the bite and what impact did it have?**

   Prompts:

- How did you react to it initially?
- Has anything change for you since your dog bit? What are the things that have changed? Examples
- Has the bite have an impact on your personal life- family, work, relationships? What impact did it had? examples
- Has the bite had an impact on your day-to-day routines? What impact did it have? Examples
- Has the bite had an impact on your relationship with your dog? What impact did it have?
- Has what you do with your dog changed after the bite? How?
- Has your understanding of your dog changed after the bite? How? And of dogs in general?

Prompts if a dog bitten a while ago:

- How have the things you describe changed over time? Examples

Areas I'd like to learn more about when asking clarifying questions:

DOG:

- Breed, age, sex, time of acquisition, early history of the dog (including training)
- What they usually do together

BITE ACCIDENT:

- Where was that person bitten?
- When did it happen?
- What is your relationship with the victim? What was their relationship with the dog?
- Could you describe how did the dog bite them? What was the dog's behaviour, the person's behaviour etc.
- What was the response of the onlookers? How did they intervene at the time?

- In what way, if at all, could that bite been avoided? If it couldn't have been avoided, why not?

AFTER THE BITE:

- What did you do? With the dog? The victim?
- Who, if anyone, did you contact?
- What was your relationship with the victim afterwards?
- In what ways did the bite influence what you do with your dog?
- How did the bite impact your relations with the victim?
- How did the bite influence your relationship and interactions with your dog (and other dogs)?
- How do you manage your dog around others?
- What else influenced your actions after the bite?
- How has your dogs' behaviour change after the bite?

Interview Guide: Never Bitten

Narrative Questions- Never bitten

I am interested in your experiences of living with dogs/ working closely with dogs/ encountering dogs at work. I am keen to find out what are you doing to avoid being bitten, why you think you have been successful at this and about any bite near-misses you may have had. I will ask you about these issues in turn. You are welcome to start wherever feels most comfortable for you and I will also try not to interrupt you.

If they have or had a dog:

1. Tell me about a dog you currently have or had in the past.

Prompts:

- What is she/he like?
- Why do you have a dog?

2. Why do you think you were never bitten?

3. How do you tell when it is safe to interact with your dog?

Prompt:

- How do you tell when it is safe to interact with dogs in general?
- When would you avoid interacting with your dog?
- What about the other dogs?
- How is it different from interacting with other dogs?

4. What do you do to interact safely with your dog?

8. In your experience, what are the reasons for dog bites?

9. If you have experienced a 'near miss' with your dog or another dog, can you tell me about it?

Prompts:

- What was happening before the near-miss? (the victim, the owner, the dog)
- Why do you think you were not bitten on that occasion?
- Has this incident had any impact on you? What impact did it have on you? Examples
- What happened after this incident?
- Has the incident influence how you interact with dogs/ your dog? In what ways? Examples
- Has the near miss had an impact on your relationship with your dog? What impact did it have? Examples
- How have the things you describe changed over time? Examples

<u>Or (if they meet dogs at work)</u>

1. Tell me about a dog you currently have or had in the past.

Prompts:

- What is she/he like?
- Why do you have a dog?

2. Please tell me about the encounters with dogs at work- what usually happens when you meet a dog?

Prompts:

- How often does it happen?
- What influences your behaviour around dogs?

3. How do you tell when it is safe to interact with a dog at work?

- Is it different from interacting with dogs in other contexts? How?
- When would you avoid interacting with a dog at work?

4. What do you do to make yourself and others safe around dogs?

5. In your experience, what are the reasons for dog bites?

4. If you have experienced a 'near miss' can you tell me about it? If this happened more than once, please choose one particular incident to focus on.

Prompts:

- What was happening before the near-miss? (the victim, the owner, the dog)
- Why do you think you were not bitten on that occasion?
- Has this incident had any impact on you? What impact did it have on you? Examples
- What happened after this incident?
- Has the incident influence how you interact with dogs/ your dog? In what ways? Example
- Has this incident influence how you go about your work? In what ways?
- Has this incident affect your relationship with your own dog? In what ways
- How have the things you describe changed over time? Examples

Areas I'd like to learn more about when asking clarifying questions:

DOG

- What sort of dog was it? Breed, age, sex, time of acquisition, early history of the dog (including training)
- What they usually do together (if their dog)

NEAR-MISS INCIDENT

- What was happening before the incident? (what were you doing, what was the dog doing, what were other people doing?)
- Where were you at the time of the incident bite?
- When did it happen?
- What was your relationship with the dogs' owner?

AFTER THE INCIDENT

- What did you do? (e.g. Shout/ scream/ cry/ lie down….)

- Who, if anyone, did you contact?
- What happened with the dog? (locked in? reported? Punished? Nothing?)
- How has your relationship with the owner change since the near-miss?

Focus Group Discussion Guide

Focus group discussion guide

I am interested in your experiences of dog bites and risk around dogs that you're facing at work I will ask about these issues and I'd like you to talk about these issues as a group. Feel free to comment, ask further questions agree or disagree with others!

1. What is the most dangerous aspect of your job? When are you at the greatest risk?
    a. What's the most stressful part of your job?

2. What happens after the bite? How are these decisions made?
    a. PTS decisions
    b. Impact of being bitten on work
    c. Impact of being bitten on relationship/ perceptions of dogs
    d. Impact of being bitten on relationships with colleagues/ employer
3. How do you prevent bites at work?
4. How, if at all, can you predict dog behaviour?
5. How do you cope when working with potentially dangerous dogs?
    a. In what ways does knowing the dog shape how you work with them?
    b. What does working with dogs involve?
6. How has your work changed over years? If at all?
7. How do you feel about yourself and your colleagues being bitten?
8. In what ways, if at all, are bites at work preventable?
9. In what way, if at all, do your relations with family, friends and colleagues influence your work with dogs?
    a. Family
    b. Social relations with colleagues
10. How do you teach someone to be safe around dogs at work?
11. How are your interactions with dogs at work and outside of work different, if at all?

Appendix 8

Recruitment leaflet

HAVE YOU EVER BEEN BITTEN BY A DOG?

HAS YOUR DOG EVER BITTEN SOMEONE ELSE?

PERHAPS YOU MEET DOGS AT WORK OR LIVE WITH DOGS BUT YOU'VE NEVER BEEN BITTEN?

Hello!

My name is Sara Owczarczak-Garstecka and I'm a PhD researcher at the University of Liverpool studying perception and prevention of dog bites.

I'm looking for volunteers who have been bitten by a dog, whose dog has bitten someone else or who encounter dogs at work or own a dog but have never been bitten. I'd like to carry out interviews to learn more about your experiences.

Through this research we are hoping to understand how bites occur and what are their consequences.

If you'd like to find out more, please get in touch:

owczarcz@liv.ac.uk
@SaraGarstecka
(0)7525366423

Appendix 9

Intranet add

In my research I use interviews and observations of daily activities that include dogs or were affected by being bitten by a dog. I'm looking for volunteers with the following experiences who would like to take part in my study:

- being bitten by a dog (or being a parent of a child bitten by a dog),
- being an owner of a dog that has bitten someone
- or being an owner of dogs without experiencing being bitten/ encountering dogs at work or outside without ever being bitten.

If you are interested in taking part in this study or would like to ask more questions, please get in touch: s.owczarczak-garstecka@liverpool.ac.uk

Best wishes,

Sara Owczarczak-Garstecka

Institute of Infection and Global Health

Correspondence address:

Institute for Risk and Uncertainty

Chadwick Building

University of Liverpool

Liverpool

L69 7Z

Appendix 10

Recruitment poster

HAVE YOU EVER BEEN BITTEN BY A DOG?

HAS YOUR DOG EVER BITTEN SOMEONE ELSE?

PERHAPS YOU MEET DOGS AT WORK OR LIVE WITH DOGS AND YOU'VE NEVER BEEN BITTEN?

My name is Sara Owczarczak-Garstecka and I'm a PhD researcher at the University of Liverpool studying perception and prevention of dog bites.

I'm looking for volunteers who have been bitten by a dog, whose dog has bitten someone else or who encounter dogs at work or own a dog, but have never been bitten by dog. I'd like to carry out interviews to learn more about your experiences.

Through this research we are hoping to understand how bites occur and what are their consequences.

To find out more and to take part please get in touch:

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