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COVID-19: Effects on early behavioural development of dogs

Nationwide lockdowns and regional tiered restrictions have had a massive impact on the daily lives of humans and therefore an inevitable impact on pets. This article discusses potential behavioural consequences for dogs, in particular young puppies, so that vets and vet nurses are aware of problems that might arise. The key role of the general practitioner should be proactively seeking to spot behaviour problems promptly. They should also have basic foundation knowledge to enable them to give clients first aid advice, whilst, if required, awaiting further more detailed investigation and diagnosis by a Certificated Clinical Animal Behaviourist.

Key words: puppy socialisation, behaviour problems, fear, anxiety, aggression, behaviour referral

Introduction



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In our role as veterinary professionals, it is a key responsibility to ensure excellent welfare of our patients. This means not only physically, but also their emotional well-being, both whilst they are visiting us at the surgery as well as including their experiences in the wider world. Nationwide lockdowns and regional tiered restrictions have had a massive impact on the daily lives of humans and therefore an inevitable impact on pets. This article discusses potential behavioural consequences for dogs, in particular young puppies, so that vets and vet nurses are aware of problems that might arise. The press has been full of headlines such as *'The Covid-19 puppy boom - one in four admit impulse buying a pandemic puppy', 'One in 10 'pandemic puppy' owners worried about life after lockdown'*. There will be many clients in need of support and it is our professional responsibility to ensure that they are aware of the veterinary practice as the most appropriate source of initial advice. The key role of the general practitioner should be proactively seeking to spot behaviour problems promptly. They should also have basic foundation knowledge to enable them to give clients first aid advice, whilst, if required, awaiting further more detailed investigation and diagnosis by a Certificated Clinical Animal Behaviourist.

Types of problems

The inevitable changes in lifestyle such as more people working from home, lack of social contact between human households and unfamiliar people and so on all risk the development of behaviour problems even in previously emotionally stable, well-adjusted dogs (see Table 1). In a Dogs' Trust funded survey published in 2021 (Holland *et al.*) one of the main concerns highlighted was the lack of dogs being left alone during lockdown measures, a significant risk factor for the development of separation related behaviours. One group of dogs which gives rise to highly significant concern with regard to long term impact is young puppies. Presentation of a young puppy to the surgery is a key opportunity to provide preventative or first-aid advice to help owners to educate their dogs to become well adapted, well behaved family members. The COVID-19 restrictions that we have experienced have hugely interfered with our ability to provide that advice, because of reduced face-to-face contact with clients, and also for clients to be able to implement appropriate education in a world that has been closed down.

Early socialisation

Knowledge of fundamental principles of early puppy education and how to successfully achieve this is an essential prerequisite, before discussing how COVID-19 may have interfered with the ability for this process to be effectively implemented. In this article, the broad term 'socialisation' is used to refer to the general education of puppies where strictly socialisation refers only to the social aspects of their learning and we of course need to be considering non-social learning as well.

Table 1: Potential negative canine behavioural consequences of COVID-19 restrictions on human lifestyle

Human change	Potential Canine Changes	Behavioural risks
Working from home	• Lack of rest time • Increased dependence on human company • Lack of opportunities to learn to be/practice being in social isolation • Greater proportion of time with owner present but their attention on tasks rather than the pet	• Separation related behaviours • Attention-seeking behaviours • Avoidance or aggressive responses if not given enough space and rest
Schools closed	• Lack of rest time • Increased potential for undesirable behaviour being reinforced by children • Increased unpredictability of the environment • Lack of opportunities to learn to be/practice being in social isolation	• Attention-seeking behaviours • Avoidance or aggressive responses if not given enough space and rest • Poor general obedience • Anxiety associated with unpredictability • Separation related behaviours
Poor human mental health	• Interspecific synchronisation of long-term stress levels (Sundman *et al.* 2019) • Increased unpredictability of the environment	• Potentially any behaviours associated with anxiety
Social distancing	• Lack of learning opportunities to develop social skills with unfamiliar people and other dogs • Building an expectation of lack of interaction with unfamiliar people	• Fear of interaction with unfamiliar people • Frustration at changes in expected behaviour learned from prior experiences
'Stay at home'	• Lack of learning opportunities about multiple stimuli in the wide environment • Potential lack of /reduced predictable routine • Lack of opportunities to learn to be/practice being in social isolation	• Inappropriate behavioural development for puppies and adolescents • Development of new problems in adult dogs e.g. fear of traffic when roads suddenly busy again • Separation related behaviours
No visitors	• Lack of learning opportunities to develop social skills with visitors (human and canine)	• Fear responses to unfamiliar people entering the home • Fear responses to familiar people, known only from outside the home, who now enter the home
Once daily exercise (1st lockdown)	• Inappropriate pattern or amount of exercise for many dogs	• Behaviour problems related to lack of mental and/or physical stimulation
Local council dog lead restrictions	• Some dogs were walked entirely on lead due to local restrictions • Some dogs were not allowed to interact with other dogs or people	• Frustration at lack of opportunities for conspecific social interaction and play • Behaviour problems related to lack of mental and/or physical stimulation
Increased online shopping	• Increased opportunities to practice territorial reactivity • Increased learned expectation that visitors do not enter the house	• General increased arousal from repeated territorial insults • Fear of visitors starting to enter the home as restrictions lift
Disruption to training classes	• Impact on socialisation and training of new puppies • Impact on mental stimulation for older dogs attending classes such as agility • Reduced exposure to other dogs	• Problems relating to general obedience and life skills • Behaviour problems related to lack of mental and/or physical stimulation • Lack of opportunities to learn and maintain dog-dog social skills risks development of fear and/or frustration responses

Social experiences throughout life influence gene expression and behaviour. However, during early development these influences have a particularly profound effect on the long-term behavioural organisation of the brain. These sensitive periods are when ***puppies are at their optimum for learning positive associations with their own species, other species and environmental stimuli and most importantly learning how to interact appropriately with these social and non-social stimuli***. If the animal does not experience appropriate stimulation during these periods, it may be difficult, ultimately less successful, or even impossible, to develop some functions later in life (see Table 2).

During the socialisation period, puppies need to learn to communicate with their own species, with humans and with any other species they may co-habit with or encounter such as cats, horses, chickens. This means learning to interpret the intentions of other social beings, most importantly whether they are being friendly or threatening. Much of the human-directed and dog-directed aggressive behaviour observed in dogs is motivated by fear, as a result of either a generalised fear of the unfamiliar or a misinterpretation of a person's body language and behaviour, thereby incorrectly believing them to be a threat. Appropriate experience when young, enables puppies to develop their skills at reading human body language and therefore respond in a desirable manner. They also allow puppies to learn that novel and unfamiliar stimuli are not always scary or threatening. See Figure 1.

Table 2: Potential consequences of inadequate socialisation

Abnormal fear responses
Social inadequacies
Hyperactivity
Increased aggression
Decreased learning ability

Evidence for early sensitive periods

Many experiments were carried out in the 1950s and 1960s researching behavioural development in puppies which demonstrated the vital importance of early exposure to social and non-social stimuli during the early weeks of life. For example, in 1961 Freedman *et al.* published work on the effects of introducing puppies to humans at different ages, as seen in Table 3. Scott and Fuller (1965) reported on similar work and found that if puppies were not exposed to people prior to 14 weeks of age they were essentially similar to wild animals in their interactions with man.

Fox (1971) also did experiments with non-social objects in a similar way. Puppies were reared in a barren environment and at different ages were placed into a test room with several novel objects. When placed in the test room at five weeks they showed positive exploratory and investigatory activity but as the age of exposure increased, they showed increasing levels of fear. Those who first entered the test room at eight weeks showed withdrawal and fear responses and those that were as old as 12 or 16 weeks were described as 'catatonic with fear'.

Dietz *et al.* (2018) published an excellent review paper on this topic which is recommended to readers seeking to widen their knowledge.

Table 3: Evidence for the importance for puppies of early exposure to humans (Freedman *et al.* 1961)

Age of introduction to humans (weeks)	Response of puppies
<3	Little reaction
3-5	Active approach, sought interaction
5-9	Increasing apprehension to approach, Apprehension increases with age
14	Remained fearful even after many weeks of careful handling



Figure 1: At 12 weeks old this puppy is already nearing the end of the socialisation period and needs to already have had a wide variety of positive social and environmental experiences.

Learning about novelty

These experiments, along with many others, were suggestive that the time when puppies are most predisposed to learning positive associations with novel stimuli is from 3-5 weeks of age and once the fear response has become fully mature, at around 12 weeks of age, their initial response to novelty is fear. This means it is absolutely key to balance risks of disease exposure with risk of inadequate behavioural development. All puppies, regardless of vaccination status, must be given appropriate safe learning opportunities both at the breeder and as soon as they arrive with their new owners.

Variety is crucial for them to learn the general concept that encountering novel stimuli, social and non-social, interactive and non-interactive, does not usually result in adverse consequences. If puppies don't experience sufficient novelty and undergo this generalisation process then they may show undesirable fear responses to novel social stimuli and also inanimate objects such as wheelie bins, post boxes and parked bicycles. They should encounter and learn about a wide variety of social and environmental novelty during these early weeks of life and learn positive associations with those experiences so that they learn not to fear novelty itself.

Learning processes

Two key learning processes are relevant to education of young puppies which need to be taken into account when tailoring socialisation to every individual puppy. A major part of the socialisation process is not teaching puppies to be excessively *sociable*, but teaching them to ignore most of the distracting stimuli they encounter and help them to develop into well-adjusted, emotionally stable adult dogs.

Habituation is the process that results in decreased response to specific repeated stimuli that have no consequences (Domjan 2003). The purpose of this