



I'm not alone,' said the boy. 'I've got a puppy

Nadia Micali^{1,2,3}

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The COVID pandemic has seen a rise in the demand for pets and pet ownership in many countries. We lived lockdowns and strict physical distancing rules in the last 12 to 18 months, spending more time with our pets or getting attached to new pets, whilst unable to spend time with family and friends. Pet ownership during the pandemic was likely beneficial for many of us, and recent research showed that it even mitigated the effects of COVID-19 lockdown on mental health and loneliness amongst adults [1]. In this context (and being a pet lover and self-confessed dog-owner and lover), the study by Crawford and colleagues [2] published in this issue seems very timely.

This study focuses on the longitudinal effect of pet death on childhood psychopathology relying on one of the best-studied and well-defined European cohorts, the Avon Longitudinal Study of Parents and Children (ALSPAC). Thanks to the availability of longitudinal data from early life onwards on pet ownership, pet loss, and childhood psychopathology the authors investigate the effect of having been exposed to household pet death (and pet death in general) on psychopathology at 8 years of age. The authors were able to compare exposure to pet death to having a pet but not having experienced pet death, and never having had a pet in the household during childhood. Children exposed to pet death had higher levels of psychopathology compared to the non-exposed children, even when accounting for known variables associated with childhood psychopathology. Surprisingly these

effects differed by sex, in that differences in psychopathology were significant amongst boys who had been exposed to pet death but not girls. Additionally, in-depth life course analyses showed that timing, recency, and accumulation of exposure to pet death did not affect the association between pet death and child psychopathology. Child psychopathology was investigated using a summary score from the Strengths and Difficulties Questionnaire indicating altogether more emotional and behavioural difficulties. Whether there is a specific effect on emotional difficulties was not addressed in the study, but would have been very interesting, particularly given the known sex differences across emotional and behavioural difficulties in childhood, and the available evidence on emotional symptoms in relation to childhood adversities (e.g., [3]).

The study highlights that children who experienced pet loss were also more likely to be exposed to financial hardship, caregiver physical or emotional abuse, and physical or sexual abuse, and belonged to more disadvantaged families (lower socio-economic status (SES)). Children exposed to pet death might, therefore, be at risk due to the combination of pet death, multiple adverse life events, and lower SES. In this context, it remains to be determined whether there might be a cumulative effect of pet death as *one more* adverse life event, or pet death and other adverse life events might mainly be a proxy of disadvantage (for example, pet death might be more common in lower SES families due to difficulties in taking care of the pet, or affording the high cost of veterinary care). Children from families with low SES are exposed to more adverse life events. There is also evidence that exposure to life events interacts with lower SES in leading to higher child psychopathology in longitudinal studies [4]; and might be a mediator in this association.

The type of pet, and bond between the child and pet might be important in determining the effect of pet death on psychopathology, albeit very difficult to measure in the context of a longitudinal population-based study such as ALSPAC, and might be important in a future study. Although the effects of bonds between children and pets have been understudied, there is some evidence of a positive effect of pet

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✉ Nadia Micali
n.micali@ucl.ac.uk

¹ Department of Psychiatry, Faculty of Medicine, University of Geneva, Geneva, Switzerland

² Department of Pediatrics, Obstetrics and Gynecology, Faculty of Medicine, University of Geneva, Geneva, Switzerland

³ Great Ormond Street Institute of Child Health, University College London, London, UK

(particularly dog) ownership on a series of child outcomes (e.g., emotional, behavioural, and social development) [5]. One could speculate that attachment to a pet might be in some ways ‘protective’, or be a resilience factor. The need to identify factors that buffer the negative effects of multiple adversities has been highlighted [6]. It remains to be determined whether pet ownership in childhood altogether might provide some sort of resilience for psychopathology later on in life. There are protective effects of positive engagement with pets in children exposed to domestic violence [7]. Attachment to a pet has been suggested to mediate the positive effect of pet ownership on self-esteem for example. The hypothesised mechanisms for this effect include stress reduction thanks to physiological and psychological responses to a pet, attachment to the pet, increased social support, and companionship from a pet. There is evidence that humans do develop attachment like relationships with their pets and that a pet can be an attachment ‘figure’ [8]. Secure pet attachment has been shown to be associated with lower psychopathology amongst adult dog owners [9]. In particular, there has been some research on dogs, and attachment of humans and pet dogs, showing that oxytocin might play an important role in dog–human interactions. Affiliative behaviour and interaction (mainly stroking, petting, and talking) between dogs and humans increases oxytocin levels in both humans and dogs [10]. The social brain network is preserved across mammalian species, and comparability of neurophysiology and hormone response of social behaviour in dogs and humans, underlying similar neurophysiological responses, has been suggested [11]. Affiliative behaviour with dogs also affects stress. Short-term interactions with dogs lead to lower cortisol levels after a stressor in children with insecure or disorganised attachment, and the presence of a dog modulates stress and cortisol responses during a stressful situation [10].

This evidence is strengthened by the fact that pet therapy and dog-assisted therapy have gathered some momentum and are increasingly used and tested in the context of several psychiatric disorders, such as post-traumatic stress disorder and autistic spectrum disorders.

Hence, in a pandemic and post-pandemic world, reframing Crawford et al. [2] and Lord Tennyson’s words it is likely *better to love a pet than not to love one*. However, the

attachment between our animal companions and us should not be considered lightly, we do attach to them, we support each other through thick and thin, and losing a pet can have important consequences that should not be underestimated on our patients (be it children or adults).

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