Dog-related activities and human well-being in Brazilian dog owners: A framework and cross-cultural comparison with a British study

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Abstract
Despite the abundance of studies investigating the benefits of having a dog, the specific aspects of dog ownership that impacts human well-being are not well understood. This study used a qualitative approach to create a framework of the main dog-related activities perceived by Brazilian owners to impact their well-being and compared the findings with those of a similar study in England. Thirty-two Brazilian dog owners from the five regions of the country were remotely interviewed. The thematic analysis of the transcripts generated a total of 58 dog-related activities, organised into 13 themes. Most activities were reported to have a positive effect on participants' well-being, accounting for 76.8% of the total number of mentions in the interviews. 'Playing with dog' and 'Dog presence' were the themes most frequently associated with positive well-being outcomes, whereas 'Unwanted behaviours' and 'Failing to meet dog's needs' were the most commonly associated with negative outcomes. The dog-related activities reported by Brazilian dog owners and the well-being outcomes linked to those activities were consistent with the previous British sample in the framework that emerged. These findings suggest reliability between the two methods used to gather data (remote interview versus focus group) and, most importantly, provide consistent cross-cultural evidence for how certain activities impact dog owner's well-being.

Keywords
Brazilian, British, dog ownership, mental health, pet ownership, psychological well-being, subjective well-being

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Introduction

Increasing effort is being made to assess the effect of dog ownership on human well-being to explore its potential uses for human mental health improvement. However, most studies appear to involve Caucasian participants from Europe, North America and Australia, and there is a lack of comparative work to establish if the effects have cross-cultural consistency. Despite an estimated pet dog population of more than 52 million animals in Brazil (the second largest in the world), this demographic is underrepresented in the investigations of dog ownership and human well-being.

A growing body of research appears to associate pet ownership in general with improvement in human health, often referred to as the ‘Pet Effect’, including increased life satisfaction, positive emotions and a sense of purpose, self-esteem, physical fitness, decreased chance of dying one year after a heart attack, and lower blood pressure, along with reduced negative emotions, depression and a reduction in medical visits. A review performed by the American Heart Association suggested that dog ownership might play a causal role in reducing heart problem risks. Conversely, the negative effects of pets for humans have been reported, but far less frequently. These negative effects include, for example, increased depression, poorer physical health, increased boredom and loneliness and decreased life satisfaction. Some studies have not observed any significant effects, for example, no effect of pet ownership on self-esteem and physical health, life satisfaction, and depression and anxiety. Hence, recent reviews have concluded that the effects of pets on owner depression and chronic pain are inconclusive. These inconsistent results probably reflect the complexity of the human–animal relationship alongside methodological differences between studies, a lack of consideration of confounding variables and a tendency to report positive effects.

Barcelos et al. recently suggested that researchers should focus on specific operationally defined dog human-related activities (DHRA), defined as any interaction or event related to the dog, with or without its presence (direct and indirect), as independent variables rather than the crude measure of simply being a ‘dog owner’. Dog ownership status is over-simplistic because it overlooks potentially important moderating factors, such as the quality of the relationship, which itself is influenced by objectively measurable factors, such as the time spent with the animals and shared activities. For example, one study that observed no difference in psychological well-being between dog owners and non-owners had very few participants who engaged in activities with animals, such as walking or playing. Dog owners may also benefit from this relationship in different ways, depending on the individuals’ needs and circumstances. The concept of human well-being is also complex and involves both subjective and psychological well-being. The former encompasses hedonia (the experience of more positive emotions and less negative emotions) and life satisfaction, while the latter, traditionally referred to as eudaimonia, has six aspects: autonomy, environmental mastery, personal growth, purpose in life, personal relationships and self-acceptance. All aspects of well-being need to be considered to appreciate where important impacts from ownership may lie. Furthermore, cultural and geographical factors may also influence the impact of pet ownership on human well-being, for example, the choice of pets, purpose and role of the pet and how they are cared for.
The aim of this study was to use qualitative methods with a Brazilian sample of dog owners to generate a thematic framework of the main DHRA reported to impact on human well-being and examine its consistency with the results previously obtained from British dog owners. We hypothesised that the overall themes of DHRA and associated well-being outcomes would be similar for the two culturally different samples, but constituent activities might show more variability.

Methods

The study was approved by the delegated authority of the University of Lincoln (reference number: UoL2020-CAB-001) and the Brazilian National Commission of Ethics in Research (reference number: 4 461 501). Participants received an information sheet and provided written informed consent.

Participants

Brazilian dog owners over 18 years old were recruited through non-probability, purpose maximum variation sampling and, less frequently, chain or network sampling, using social media. A recruitment survey (QualtricsXM) used for registration asked for owner name, gender, dog ownership details (including breed, size, age of the currently owned dog(s) and length of dog ownership), expertise in animal behaviour (animal care, animal training or animal-assisted interventions), city/state of residence, local environment (urban/rural) and where the dog lived (house, yard and flat).

The selection of participants for the interviews aimed for a balance in demographics to obtain a sample composed of a wide array of dog owners with varied relationships with their dogs. The sample size was determined by inductive thematic saturation, that is, when no new insights were identified from the new data. Data collection was ended after three interviews in a row provided no new information. To recognise the saturation point, data collection and analysis were performed on the same day.

Interviews

The interviewer received initial training from an experienced researcher in conducting interviews. A pilot interview was conducted to test the order and clarity of the explanations and questions, assessing their efficiency in gathering meaningful data. Remote face-to-face interviews were conducted through Blackboard Collaborate Ultra and recorded using Blackboard Collaborate Ultra and a portable recorder (Digital Voice Recorder SuperEye). Semi-structured interviews with a predefined questioning route were used alongside a PowerPoint presentation to guide participants on the meaning of key concepts explored (Supplementary Material). As with, the method of Barcelos et al., the concepts of DHRA, life satisfaction and hedonic and eudaimonic well-being were introduced to the participants, and they were asked to describe important DHRA and their perceived impact on their well-being. Interactions, activities and events related to their dogs, including both direct (with the presence of the dog) and indirect (without the presence of the dog) DHRA, were accepted for the study. To explore life
satisfaction and hedonic well-being, each participant was asked to write down four main DHRA, relating each one with an effect on positive/negative emotions or life satisfaction. The researcher used minimal examples to avoid leading. Participants were asked to narrate their answers, and probes were used for clarification. For eudaimonic well-being, owners were presented with details of the six eudaimonic components and were asked to write down four DHRA with a positive or negative effect on any of these, being free to comment on all or none of them. The interviewer used probes to further explore the participants’ comments, as deemed necessary.

Interviews lasted 19.4–60 min (mean 42.7 min).

Data analysis

The recordings were transcribed and analysed using NVivo 11. A thematic analysis was performed, sorting participants’ comments on DHRA and human well-being outcomes into codes (short text containing a summative meaning) and themes (categories of codes), for example, ‘walk the dog’ and ‘run’ were grouped together in the theme ‘Exercise with dog’. Similarly, the outcomes were categorised into hedonic or eudaimonic well-being and life satisfaction. The hedonic aspect was categorised according to the affective dimensional model into: high/low activation and positive/negative valence. The themes of eudaimonic well-being were divided into six components. The last stage of the analysis involved matrix coding whereby the connection between DHRA and well-being outcomes was made, considering the frequency of their mentions to construct a framework of the most relevant activities for the owners’ well-being. A heat map was built to allow the visualisation of the most frequently mentioned dog-related activities and outcome themes (Figure 1).

Cross-cultural comparison

The framework generated in this study was compared with the one constructed from the data obtained via focus groups with British dog owners noting cross-cultural differences and similarities.

Results

Of the 258 responses to the recruitment survey, 166 were complete and met the age-related inclusion criterion. Thirty-two Brazilian dog owners were interviewed and an effort was made to achieve a balance in sample demographics. Participants came from all five regions of the country and from both rural and urban areas; they included both binary genders (62.5% being female), ages ranging from 18–25 to 64–74 years, mainly dog owners without any animal-related expertise (59.4%), involving 26 dog breeds, the median age of 4–6 years and across all body sizes (Supplementary Material).

The 59 activities described as the most impactful on participants’ well-being were used to build a framework with 13 themes of DHRA (Figure 1). The percentages relate only to the sample studied and should not be generalised at any level to the Brazilian population.
The most frequently mentioned themes and activities were, respectively, ‘Dog presence’, ownership (104 mentions, 17.4%), with emphasis on the activity ‘dog presence’; ‘Providing for the dog’ (77 mentions, 12.8%), particularly the activity ‘look after the dog’; ‘Exercise with dog’ (64 mentions, 10.7%), especially the activity ‘walk the dog’; ‘Tactile/close interaction’ (53 mentions, 8.8%), with emphasis on the ‘proximity/physical contact’ activity; ‘Social interactions’ (47 mentions, 7.8%), particularly ‘talk about the dog’ activity; ‘Teaching or learning’ (43 mentions, 7.2%), especially the activity ‘dog learns something/solves a problem’; and ‘Unwanted behaviours’ (41 mentions, 6.8%), with emphasis on the activities ‘dog barks, lunges, growls at others’. 

**Figure 1.** Heat map of the dog human-related activities (DHRA) and related impacts on Brazilian dog owners’ well-being. The darker the cell, the higher the relative frequency of reporting of the activity (rows) in relation to the given aspect of human well-being (columns). 

Aut: autonomy; Env: environmental mastery; Ha: high arousal; La: low arousal; LS: life satisfaction; Nv: negative valence; Per: personal growth; Pos: positive relations with others; Pur: purpose in life; Pv: positive valence; Sel: self-acceptance.
As anticipated, the generally reported effects of DHRA were mostly positive on human well-being (76.8%), particularly due to improvements in emotions/feelings (47.0%, Table 1). Worsening in well-being (23.2%) due to dog-related activities manifested mostly through increases in negative affect (15.2%, e.g. annoyance, anger, sadness and frustration).

**DHRA and hedonic well-being**

Figure 2 shows the reported effects of DHRA themes on the circumplex model of affect. The most cited impacts were increasing positive valence emotions of low (149 mentions, 24.8%) and high (116 mentions, 19.3%) arousal.

**DHRA and positive valence high arousal**

Activities related to the themes ‘Playing with dog’ and ‘Exercise with dog’ had the greatest positive contribution on emotions in this quadrant, such as ‘happy’ and ‘joyful’. For example, Participant 3 reported:

*Playing, I feel like a child again, it is a moment of fun, I feel that they call us to a good situation in life, for us to remember good things, for us not to get stuck in work. [Effect of activity ‘play with the dog’ increasing ‘fun’]*

Activities that lowered this state were not reported.

**DHRA and positive valence low arousal**

‘Dog presence, ownership’ and ‘Tactile/close interactions’ themes were the most frequently mentioned to increase the emotions/moods in this quadrant, such as ‘tranquil’ and ‘loved’. For example, Participant 29 reported:

**Table 1.** The number of mentions of the effects of dog human-related activities (DHRA) on different aspects of human well-being.

| Well-being effect   | Number of mentions | Total of mentions |
|---------------------|--------------------|-------------------|
| Hedonia             |                    |                   |
| Positive            | 282 (47.0%)        | 373 (62.2%)       |
| Negative            | 91 (15.2%)         |                   |
| Eudaimonia          |                    |                   |
| Positive            | 171 (28.5%)        | 219 (36.5%)       |
| Negative            | 48 (8.0%)          |                   |
| Life satisfaction   |                    |                   |
| Positive            | 8 (1.3%)           | 8 (1.3%)          |
| Negative            | 0                  |                   |
I like it when she (dog) licks me, it makes me very calm, even more relaxed. [Effect of activity physical contact initiated by the dog’ increasing ‘calmness’ and ‘relaxation’]

There was no reported DHRA that lowered this state.

**DHRA and negative valence high arousal**

Increasing emotions such as ‘anger’ and ‘worry’ were related mainly to the themes ‘Unwanted behaviours’ and ‘Failing to meet dog’s needs’. For example, Participant 18 said:

*When she (the dog) runs after the cat, barking, she chases him, he runs away from her, that annoys me.* [Effect of activity ‘dog chases animals’ increasing ‘annoyance’]
Several activities were associated with a lowering of this group of emotions, mainly attributed to the theme ‘Playing with dog’ (62.5% of the contribution for this result). For example, Participant 2 reported:

There are days when I get here (at home) very distressed, then when I play with them (the dogs) everything goes away. [Effect of activity ‘play with the dog’ decreasing ‘distress’]

**DHRA and negative valence low arousal**

Dog’s ‘Unwanted behaviours’ and ‘Failing to meet dog’s needs’ were the themes that mostly contributed to increased emotions in this quadrant, such as ‘sadness’ and ‘tiredness’. For example, Participant 5 said:

If I leave the house, it makes me sad because she (the dog) sits at the door waiting for me to return, this feeling of abandonment is related to my absence, it is something that is not healthy for me, because I know she is suffering. [Effect of activity ‘leave the dog behind/alone’ increasing ‘sadness’]

‘Dog presence, ownership’ and ‘Providing for the dog’ were reported as more relevant for reducing these emotions, with ‘Dog presence, ownership’ being highly consistently mentioned as having this effect (88.8% of the mentions about this outcome). For example, Participant 30 reported:

She (the dog) stays with me a lot when I am doing something, sometimes she comes to my bed and the feeling would be like you don’t feel lonely, I feel less lonely with her here. [Effect of activity ‘dog presence’ decreasing ‘loneliness’]

**DHRA and life satisfaction**

The theme most frequently reported to improve respondents’ life satisfaction was ‘Dog Presence, ownership’, followed by ‘Picture-related’ and ‘Tactile/close interactions’. These were the only themes reported to impact life satisfaction, and each accounted for at least 10% of the mentions of this aspect of well-being. For example, Participant 14 said:

I don’t know why, but since they (the dogs) arrived, our life has improved, I have my company, it’s going well, I think that one thing reflects on the other, if I weren’t doing so well with them (the dogs), I wouldn’t be doing so well at work and vice-versa. [Effect of activity ‘having the dogs’ increasing ‘life satisfaction’]

There was no report of negative effects on this aspect of well-being.

**DHRA and eudaimonia**

Figure 3 shows the themes of dog-related activities that influenced eudaimonia. The most frequent impacts were increasing positive relations (59 mentions, 9.8%), increasing personal growth (42 mentions, 7.0%) and increasing self-acceptance (28 mentions, 4.7%).
Figure 3. Effects of dog human-related activities (DHRA) themes on Brazilian participants’ eudaimonia. Themes represented in bold indicate a high frequency of mentions related to that aspect (10% or higher), themes in black indicate a moderate frequency of mentions (5.0–9.9%) and themes represented in grey had a frequency considered low of mentions (0.01–4.9%). Plus sign describes a positive influence, and the minus sign describes a negative influence.

**DHRA and autonomy**

A positive influence on this aspect was mainly attributed to the themes ‘Providing for the dog’, ‘Exercise with dog’, ‘Dog presence’ and ‘Teaching or learning’. For example, Participant 30 said:

That feeling of caring for another being, I think I feel independent when I feel that I can do things for her (the dog) myself, she is not a child but they behave as if they were, you have to wake up early, have to feed them, arrange for them not to be alone, take them to the house of a friend or someone from the family because she is not an object. [Effect of activity ‘look after the dog’ increasing ‘autonomy’]

A negative effect on this aspect was mainly related to the themes ‘Dog presence’, ‘Failing to meet dog’s needs’ and ‘Providing for the dog’. For example, Participant 26 reported:

I think that having X (name of dog) in our family reduces our autonomy, because we are not so free, for example, to take a trip, to go somewhere, because we always have to take care of her. This represents a blocking for us, it sometimes bothers me that I don’t have the freedom to just say: today, I’m going to take a vacation for a week! [Effect of activity ‘having the dog’ decreasing ‘autonomy’]
**DHRA and environmental mastery**

Positive effects on this aspect were mostly attributed to the themes ‘Providing for the Dog’, ‘Exercise with dog’ and ‘Dog presence, ownership’. For example, Participant 29 said:

*I have to organize my time, the less you do, the less time you have, because you do things carelessly, but with (name of dog), I have to walk her, play, clean her paws when I enter the house, feed her, I have to plan it. [Effect of activity ‘look after the dog’ increasing ‘environmental mastery’]*

Negative effects on environmental mastery were reported by participants, also related to ‘Providing for the dog’, ‘Dog presence, ownership’ and ‘Exercise with dog’. For example, Participant 10 reported:

*I feel a moral obligation to provide her (the dog’s) food, to take her pain away if she is sick, to provide a space at home that is comfortably warm for her, so at that point, she dominates the ‘environment’ and she adds demands in life, because I find myself spending money on vet, clothes, buying toys, clothes for her. [e.g., Effect of activity ‘look after the dog’ decreasing ‘environmental mastery’]*

**DHRA and personal growth**

The themes most reported to have a positive effect here were ‘Look after the dog’, ‘Dog presence, ownership’ and ‘Teaching or learning’. For example, Participant 31 reported:

*This activity of being constantly looking for some information to help him (the dog), always looking for something new for him, there is this growth of my knowledge associated. [Effect of activity ‘learn dog-related things’ increasing ‘personal growth’]*

There was no report of negative effects on this aspect.

**DHRA and purpose in life**

Positive effects were mainly related to the themes ‘Dog presence, ownership’, ‘Providing for the dog’ and ‘Tactile/close interactions’. Participant 14 said:

*I think about my purpose in life sometimes, I make some plans, however all my plans involve my dogs, so they are an indispensable part of my life, there is no life without them, separate from them, then the meaning of my life necessarily go through them. [Effect of activity ‘having the dog’ increasing ‘purpose in life’]*

Negative effects were mainly related to the themes ‘Failing to meet dog’s needs’ and ‘Dog presence, ownership’. Participant 11 reported:

*I think about my life for the next 5–10 years, I would very much like to leave Brazil to have an international experience and maybe her presence (the dog’s) would hinder this purpose I have*
in life, I still have to think about how to deal with it. [Effect of activity ‘having the dog’ decreasing ‘purpose in life’]

**DHRA and positive relations with others**

Positive influences emerged mainly from the themes ‘Social interactions’, ‘Exercise with dog’ and ‘Dog presence, ownership’. For example, Participant 10 said:

> When I take her (the dog) to a square where there are other dog owners, the fact that I have a dog ends up stimulating interaction with other dog owners, I let her off lead there, suddenly I see her becoming friends with another dog, playing, then inevitably, the owner of that other dog approaches, then you start talking to the person, so I already made friends like that [Effect of activity ‘dog interacting with other dogs’ increasing ‘positive relations’]

Negative effects were mainly attributed to the themes ‘Social interactions’, ‘Dog presence, ownership’ and ‘Unwanted behaviours’. For example, Participant 7 reported:

> Sometimes they do hinder and diminish personal relationships, at least at home, because he (the dog) barks too much at home and he tends to pee on everything, generating conflicts with people. [Effect of activities excessive bark in the house’ and ‘dog house soiling decreasing ‘positive relations’]

**DHRA and self-acceptance**

The themes ‘Tactile/close interactions’, ‘Dog presence, ownership’, ‘Shared activities in the house’, ‘Social interactions’ and ‘Picture-related’ were described as the most important for increasing self-acceptance. For example, Participant 10 said:

> You arrive at your house, when you open the door, he (the dog) does not want to know if you are rich, poor, if you are dating, if you are alone, if you are employed or unemployed, he will receive you with all the happiness in the world, will jump on your lap, will lick you, will celebrate, it contributes a lot to your self-acceptance. [Effect of activity ‘dog greeting the owner’ increasing ‘self-acceptance’]

A negative contribution was related mainly to the theme ‘Failing to meet dog’s needs’. For example, Participant 3 said:

> If I don’t succeed in taking them (the dogs) for a walk, I feel really bad, for example, if I did not have time or something happened that I couldn’t walk them that day, I feel terrible about myself. [Effect of activity ‘not fulfill dog’s needs/demands’ decreasing ‘self-acceptance’]

**Comparison with UK sample**

The thematic analysis of the interviews with Brazilian dog owners generated very similar DHRA and themes (59 and 13, respectively) impacting on human well-being to the focus
groups with British dog owners (58 activities and 15 themes). Overall, the most mentioned themes of activities in the Brazilian study (‘Dog presence, ownership’, ‘Providing for the dog’, ‘Exercise with dog’, ‘Tactile’, and ‘Social interactions’) were similar to the most featured among British dog owners: ‘Exercise with dog’, ‘Non-Specific Ownership’ (e.g. look after the dog), ‘Tactile’ and ‘Social interactions’. Additionally, in both studies, well-being outcomes were mostly positive (i.e. well-being improvement due to dog-related activities); indeed, the most frequently mentioned aspects of well-being across the two frameworks were increased in the positive valence of high and low arousal (hedonia) and increase in positive relations with others (eudaimonia). Finally, the negative effects of DHRA were mostly due to increases in the negative affect of both high and low arousal (hedonic well-being) in both Brazilian and British samples. The main negative themes of activities were ‘Unwanted behaviours’, ‘Failing to meet dog’s needs’ and ‘Dog presence, ownership’, in the Brazilian sample, and ‘Unwanted behaviours’, ‘Failing to meet dog’s needs’ and ‘Aging and end of life of dog’, in the British sample.

Only two themes of activities present in the British framework did not emerge in the new thematic analysis: ‘Grooming’ and ‘Shared activities outside the house’. It became clear in these interviews that dog grooming (i.e. bathing the dog and taking the dog to the groomer) was perceived as a routine-like activity for Brazilians, such as feeding the dog. This was not the case amongst British respondents; thus, grooming-related activities have been placed here under the theme ‘Providing for the dog’ for the Brazilian sample, rather than as a separate theme. Activities related to the theme ‘Shared activities outside the house’ (e.g. dog’s company at work, animal-assisted interventions) were reported by Brazilians, and they were placed under different themes, as the location where they occurred (outside the house) was not emphasised by Brazilian owners. Finally, the British theme ‘Non-specific ownership routines’ (e.g. having the dog, being an owner, looking after the dog) has been modified to ‘Dog presence, ownership’ here, as having a dog and the dog presence were frequently mentioned together by Brazilian participants. Also, in contrast with the British study, the activity ‘Looking after the dog’ was not placed under this theme. The authors believe that ‘Looking after the dog’ fits better under the theme ‘Providing for the dog’ due to the repeated mentions of this activity together with other activities of this theme (e.g. feed the dog and brush the dog).

Although most activities appeared in both frameworks, 18 activities emerged only among Brazilians: ‘take the dog to a dog-friendly park’, ‘unable to take the dog to places’, ‘think about the dog’, ‘offer chews, food activity or toys to the dog’, ‘brush the dog’, ‘financial expenses’, ‘take the dog to the groomer’, ‘cleaning related to the dog’, ‘watch TV together at home’, ‘meet people that do not like dogs’, ‘attend events with the dog’, ‘dog looking at the owner’, ‘herding’, ‘dog learns something/solves a problem’, ‘dog chases animals/vehicles’, ‘dog pulls on the lead’, ‘tell the dog off’ and ‘observe the dog behaviour (in general)’. Likewise, 16 activities were only reported by British dog owners: ‘cycling’, ‘sledging’, ‘clean dog’s teeth’, ‘the result of dog grooming’, ‘look after a puppy’, ‘cook for dog’, ‘being followed by the dog’, ‘dog waiting for the owner to do something’, ‘trip with dog’, ‘talk to dog’, ‘inappropriate interaction with your dog – from other person or dog’, ‘biting, trying to bite, lunging’, ‘farting’, ‘poo related’, for example, roll on it, eat it, defecate in the house, ‘snoring’, and ‘see the dog in a situation that pleases the owner, for example, funny noise’.
In relation to the impact of dog-related activities on well-being, little difference was noted between the two frameworks. The only positive themes that differed slightly between countries were ‘Social interactions’ with others and ‘Picture-related’ (e.g. taking pictures and posting it on social media). British dog owners reported improvements in both hedonic and eudaimonic well-being due to social interactions, whereas Brazilians reported eudaimonic benefits only. Also, British owners only mentioned the hedonic benefits of ‘Picture-related’ activities, while Brazilians had increases in both hedonic and eudaimonic well-being associated with this theme.

In terms of activities frequently reported to have a negative impact on both hedonic and eudaimonic well-being, both Brazilian and British owners reported the following: ‘unwanted [dog] behaviours’, ‘failing to meet dog’s needs, expectations’ (e.g. leave the dog alone), ‘having the dog, being a dog owner’ and ‘look after the dog’. Likewise, ‘aging and end of life of dog’ and ‘take dog to the vet’ were described to worsen hedonic well-being in both groups. Other dog-related activities differed slightly. ‘Dog’s presence’ was repeatedly mentioned to worsen Brazilians’ eudaimonic well-being, whereas British owners only reported positive outcomes linked to this activity. ‘Social interactions’ was reported to decrease only eudaimonic well-being among Brazilians, whereas it worsens both hedonic and eudaimonic aspects among the British. Lastly, ‘walk the dog’ and ‘see the dog in a situation it dislikes’ were reported to decrease both hedonic and eudaimonic well-being in Brazilians, but just hedonic well-being in the British cohort.

Changes in life satisfaction were rarely mentioned in both British and Brazilian studies. Nonetheless, one dog-related activity consistently improved life satisfaction in the two populations: ‘having the dog, being a dog owner’. For a more detailed comparison of specific dog-related activities and well-being outcomes between Brazilian and British dog owners, the authors recommend a direct inspection of the Brazilian heatmap (Figure 1) and the British heatmap.30

Discussion

The framework of DHRA impacting on human well-being, built through a bottom-up approach with Brazilian dog owners, was remarkably consistent with the British framework.30 In both, the positive effects of dog-related activities heavily outweighed negative well-being effects. Activities such as tactile interactions, exercise, dog presence and providing for the dog were positive for both hedonic and eudaimonic well-being of owners in the Brazilian and British samples. Likewise, participants of both groups repeatedly reported decrements in their well-being due to activities such as unwanted behaviours, not meeting the animal’s needs/expectations and poor dog health. The similarity indicates the consistency of the effects of dog-related activities across cultures and robustness in the qualitative methodology used.

A small number of activities appeared in one sample and not the other. This suggests that although many activities and thematic structure are similar across the two studies, there are culturally relevant differences mainly at the level of the content of themes. While it is not expected that all possible DHRA would be mentioned in any single study, we would expect the main ones to be consistent across samples. New activities
might emerge in different populations due to cultural differences in dog keeping and activities; sampling issues (somewhat surprisingly, ‘trip with dog´ was not mentioned by any of the 32 Brazilian participants); or methodological differences (e.g. it is possible that ‘financial expenses’ and ‘tell the dog off’ were only mentioned in the Brazilian interviews, due to reluctance to share negative personal information in a group environment⁴⁷). The key point is the consistency of the overall framework, even if content differs between cultures.

**Dog-related activities and positive impacts**

In both studies, the majority of the dog-related activities effects were positive, particularly through increases in positive emotions/moods (hedonia) and positive relationships (eudaimonia). Several studies report more positive than negative emotions from interaction with dogs.²⁵,³⁴–⁵⁰ Dogs can also facilitate social interactions among people,²⁷,³⁵–³⁷ act as social lubricants⁵¹,⁵² and help in the development of trust, communication, compassion and empathy towards others.⁵⁰

Despite the caution involved in quantitative generalisation, the similarity and difference in the most mentioned themes of activities in each of the studies are notable: ‘Dog presence/ownership’, ‘Providing for the dog’, ‘Exercise with dog’, ‘Tactile’ and ‘Social interactions’ featured most in the Brazilian study, while ‘Exercise with dog’, ‘Non-Specific Ownership’, ‘Tactile’ and ‘Social interactions’ were most emphasised in the British sample.³⁰ Similarly, Brkljacic et al.⁵³ described ‘walking’, ‘petting’, ‘caring for the animal’, ‘animal’s company’, ‘dog greeting’ and ‘playing’ as important sources of happiness to owners. ‘Dog presence’ has also been associated with reduced depression, anxiety and loneliness, mood elevation in senior owners³³ and a decrease in stress response of owners’ autonomic nervous system.²⁷

Another interesting comparison is related to the theme ‘Picture-related’ (e.g. taking/posting dog-related pictures/videos), which was more impactful on the Brazilians’ well-being (hedonic and eudaimonic) compared to the British sample (only hedonia). The broader positive impact of ‘Picture-related’ activities on the well-being of Brazilians might be linked to cultural variations in smartphone and internet usage, which is higher in Brazil than in the UK. Brazilians spend on average nine hours a day on internet, compared to five hours among British people.⁵⁴,⁵⁵

Reducing negative emotions was frequently related with the themes ‘Playing’ (62.5% of mentions of high activation, e.g. decreasing stress) and ‘Dog presence/ownership’ (> 80% of mentions of low activation, e.g. decreasing sadness) in this study. This may explain the previously reported effect of pets on reducing the impact of stressful events⁵⁶ and negative feelings.⁵⁷ The current study was conducted during the COVID-19 pandemic, and several participants mentioned the dog’s presence linked to a reduction of negative emotions during these uncertain times as has been noted elsewhere.⁵⁸–⁶⁰

The influence of DHRA on life satisfaction was infrequently mentioned by both samples. However, ‘Having the dog/being a dog owner’ was described as improving life satisfaction, and several other studies suggest that pet owners are generally more satisfied with their lives than non-owners,⁶ improving the perception of life satisfaction, especially among those feeling socially excluded.⁶¹
Dog-related activities and negative impacts

Negative effects of DHRA were reported to a lesser extent. In both studies, the greatest impact was related to an increase in negative emotions (hedonism). The main themes related to negative effects were ‘Unwanted behaviours’, ‘Failing to meet dog’s needs’ and ‘Dog presence/ ownership’ (Brazilian sample) and ‘Unwanted behaviours’, ‘Failing to meet dog’s needs’ and ‘Aging and end of dog’s life’ (British sample). Several previous studies also report negative effects related to behaviour problems, inability to take pets to places, time demanded for care and animal death. The dog–human relationship has been described as functional when there is mutual benefit, and dysfunctional when there are risks to either party (physical or emotional injury), the latter being strongly associated with behavioural problems and when dogs do not receive proper care. In our work, ‘Failing to meet dog’s needs’ had a consistently negative impact across the samples and it has been described before how the strain of daily caretaking duties can reduce the quality of life, increasing owners’ negative feelings. Likewise, it was recently described how meeting the dog’s daily needs is important to the owner’s psychological well-being.

Although exercising the dog, particularly walking, had a generally positive impact, being a good motivation for physical activities, many owners do not walk their dogs. Interestingly, ‘walk the dog’ was, in this Brazilian sample, mentioned to elicit negative well-being outcomes to a greater extension than in the British one. It was stated that walking the dog generates fear in owners due to urban violence; a negative experience from this activity was also frequently linked to unwanted behaviours such as excessive barking. Our findings are consistent with the two types of dog walks recently described: functional (to provide this need for the dog, can be unpleasant to the owner) and recreational (related to the reduction of owners’ negative feelings and promotion of social interactions). The effect of dog walks varies with the characteristics of the environment (e.g. neighbourhood). Thus, it is possible that Brazilian dog owners face more environmental challenges while out with their dogs than their British counterparts.

The negative results for positive relationships (eudaimonia) were consistent across the samples, mainly linked to the theme ‘Social interactions’ and to situations of potential conflict (e.g. people who do not like dogs). Conflicts generated between dog owners and people who have no affinity for animals in urban environments are recognised as one of the challenges of pet ownership, together with cultural norms, costs and policies restricting pets in places.

Strengths of the study

A major strength of this research is its focus on both subjective and psychological aspects of human well-being to provide a comprehensive exploration of the subject. The qualitative method permitted capturing a wealth of details not contained in quantitative methods, vital for improving our understanding of complex phenomena. To obtain valid data in qualitative cross-cultural studies, unbiased measures are needed; this depends on correct translation and contextual interpretation. The main researcher of this study is a Brazilian Portuguese native speaker, the samples had high participant diversity (e.g. region, age, gender and dog size), and a similar methodology for data collection (e.g. questions asked, well-being aspects and
DHRA definition) and data analysis has been used across this and the previous British study. All these factors help to avoid errors in the comparison of results.

**Limitations of the study**

The limitations of this study to be noted include the limited generalisability of qualitative results to the population level, although the consistency of our results with those of Barcelos et al. suggests potential robustness to the relationships identified.

In interviews, the social stigma attributed to negative feelings and mental health difficulties might lead to social desirability playing a role in how much participants share negative effects, although the methodology used here would be expected to be less subject to this effect than that of the similar UK study. Also, hedonic adaptation (a return to baseline levels of well-being) may affect the results, particularly decreasing recall of positive activities, since this process is faster for positive events. Nonetheless, as noted above, the positive reports greatly outweighed the negative ones. This could also indicate sampling bias, as individuals who volunteer for this kind of study may, in general, perceive fewer negative effects of dog ownership.

**Future research**

The frameworks developed in this study and in the British study may lay the foundation for future research exploring the effects of dog ownership on human well-being and could provide useful information for the development of animal-assisted interventions to tackle human mental health issues. For example, ‘Dog playing’ has been consistently shown to increase the positive affect of high arousal in dog owners. Thus, are dog owners who play more with their dogs happier? If yes, is there a causal association? Future studies dedicated to quantitatively assess the relationships between activities and effects on well-being will help understand potential causal relationships.

A demonstration of the framework consistency in relation to different species (e.g. cats, rabbits and horses) and different owner groups (e.g. autistic, elderly and children who own dogs) is needed before generalisations can be made about the perceived effects of pet ownership and any general ‘Pet effect’. Different activities and relationships must emerge in these studies.

Future quantitative studies investigating the associations between DHRA and human well-being identified within this framework will help evaluate the extent of cultural similarities and differences that might exist. Finally, relevant covariates identified in previous studies, such as owner personality and demographics, should be taken into consideration in such quantitative analyses.

**Conclusion**

This study generated a comprehensive framework that reflects both positive and negative experiences of Brazilian dog owners, a nationality poorly covered in this field of research. The framework provides culturally focused information on the effect of dog ownership on human well-being, establishing a solid foundation for future quantitative...
investigations and contributing to a deeper understanding of the characteristics of human–animal interaction. The cross-cultural consistency of the framework developed here and that using British participants is based on largely similar activities and perceived well-being outcomes. By understanding the specific component activities, considering factors such as cultural differences, we can seek to maximise the potential benefits of dog-related activities on human well-being, for example, to deal with or prevent human mental health problems.

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Author contributions

GFC, AMB and DSM designed the study; GFC collected the data; GFC, AMB and DSM analysed the data and wrote the manuscript.

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Supplementary material

Supplementary files are available on Open Science Framework at the following link: https://osf.io/eu6xm/?view_only=9dce8e5dc6b74525a80081d6b988e352

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