Exploring Human Perceptions of Dog-Tablet Playful Interactions

Anna Zamansky
Information Systems Department
University of Haifa
Haifa, Israel
annazam@is.haifa.ac.il

Sofya Baskin
Tauber Bioinformatics Center
University of Haifa
Haifa, Israel
sfbskn@gmail.com

Vitaliya Kononova
Dog Training Private Practice
Krivoj Rog, Ukraine
vitaliyaolegovna@gmail.com

Abstract
The increasing use of digital games for pets’ enrichment and entertainment calls for better understanding of this phenomenon. While there is a lot of anecdotal evidence of pets "playing" digital games on computers, the nature of such interactions is yet to be understood. Humans - both pet owners and pet professionals, play a pivotal role in shaping the way pets interact with technology, both in terms of promoting pet-oriented technologies, as well as posing requirements for them. We present some first results of an exploratory empirical study of human perceptions and attitudes towards playful interactions of dogs with tablets.

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ACI, dog-tablet interaction, playful ACI

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

Introduction
In the spirit of user-centric interaction design, animals’ playful interactions with technology draw increasing attention of the ACI community. Playful interactions
have the potential to improve animal welfare at homes, zoos and beyond by providing cognitive enrichment and physical exercise, as creating stronger bonds between humans and non-human animals [1,2,3,4,5].

Studying dogs in the context of technology for play is particularly rewarding. Dogs are one of the most easily available companion animals; they are one of the species in which play is routinely performed by adults, including play directed at objects. Dogs have outstanding capabilities to communicate with people and study from them. Finally, their behavior is studied and understood much better than that of any other domestic animal.

One notable type of dog interactions with technology is interaction with tablets, which are devices which nowadays can be found in almost every home. This type of playful ACI is becoming more widespread: hundreds of digital games have hit the application market [6]; numerous YouTube videos featuring dogs “playing” tablet games can be found. Moreover, recently several dog training centers were reported to open classes teaching dogs to use mobile devices [7,8]; dog experts are also using tablets for cognitive development of puppies.

Despite their popularity, the impact of such interactions on pets is not yet fully understood. Attention is drawn in [9,10] to potential dangers in playful interactions of dogs with tablets and pointed out that there are several types of possible dog-tablet interactions (enjoyment, serious/hunting and overstimulating). The need for careful use of tablets in this context and better understanding of impact such “play” may have on pets was also stressed. How successful will digital games for pets become in the future? Are pet owners able to recognize the benefits, and – even more crucially, the dangers of such games for their pets? Any interaction of pets with tablets is initiated and mediated by humans; pets will only play with technological devices if humans let them. As humans play a pivotal role in the ways pets interact with technology, this leads to the need for understanding human perceptions and attitudes towards animal-computer interactions, which also holds the key to encouraging more responsible use of digital technology for pets.

To address the above challenges, we carried out an exploratory empirical study, in which we explored human perceptions of playful interactions of dogs with tablets. In what follows we present some of our findings, based on data collected from dog owners and dog professionals.

The Empirical Study
Preparation: A collection of Youtube videos of dogs playing a tablet game with a moving object were analyzed using the criteria for user behavior interpretation proposed in [9,10]. We decided to choose one video classified as enjoyment using these criteria, and another one classified as overstimulation. Video 1 (see Figure 1) features a dog wagging its tail and easily switches its attention to owner; only dog’s nose licking can be described as a very light level of motivational conflict. Video 2 (see Figure 2) represents a typical example of overstimulated interaction, with the featured dog exhibiting signs of stress and overexcitement: heavy panting, nervous yawning, and fixed attention to screen.

Data collection: 276 participants with a background in dog behavior were selected: 36 dog professionals
Positive reactions:

1. "The dog is gaining new experiences in a positive environment".
2. "The dog is cognitively stimulated".
3. "The dog is playing and play is always good for dogs".
4. "The dog can safely satisfy its predatory instincts and fulfil its natural need for active movements".
5. "It's beneficial for the development of quick reactions and general attentiveness of the dog".

Negative reactions:

1. "The dog is frustrated as it cannot reach its goal (of catching the object)".
2. "The dog is overexcited and if develops any further it can be harmful for its health and problematic for the owner".
3. "This behavior is useless for physical or obedience training".
4. "The screen may emit radiation which can damage the dog's vision".

(veterinary doctors/dog trainers), 119 students of online courses on dog behavior and 121 dog owners. The main tool of data collection was via a questionnaire administered to the participants online. In this questionnaire the participants were requested to watch videos 1 and 2 described above, and comment on the video, expressing what the dog is experiencing and feeling. Some questions were open-ended; inductive text analysis was performed, and the emerging categories were used for a qualitative analysis. Two questions used Likert scale to rate (i) how beneficial the interaction is for the dog, and (ii) how positive are the dog's emotions for each video.

Results

Due to space limitations, we present only partial results of our preliminary data analysis. The following categories were the most popular to describe dog actions emerged from our data analysis: playing, digging, hunting and scratching (see Figure 3). The most popular categories to describe the dog's cognitive state were: engaged, enjoying, overexcited, interested, puzzled and disappointed (see Figure 4). In the left column we cite some representative reactions, reflecting positive and negative attitudes expressed for both videos. Quantitative analysis of the Likert-scale based questions on the benefits and dog's emotional state in the two videos showed a statistically significant difference between the two videos, the first being rated more positive than the second. The difference was more significant for dog professionals, but was also present for non-expert dog owners. Statistically meaningful positive correlations were also found between a participant's benefit scores of the two videos, and emotion scores for the two videos (i.e., In other words, either both videos scored low, or both scored high for a given participant).

Conclusions and Future Research

Our preliminary empirical findings show that while many people perceive dog-tablet interaction as play, other categories such as hunting and digging were dominant. The attitudes were also mixed (slightly more positive for the first video, indicating that overstimulation can be recognized even by non-experts), but a significant number of participants held strictly negative view on the benefits of such interactions. A finding worth further exploring is the correlation described above between the benefit and emotion scores, which may indicate the existence of a certain prejudice among participants with respect to dog-tablet interaction, as many participants either gave low scores to both videos, or high scores to both. Thus
pre-existing opinions on dog-tablet interaction may impact one's judgement. Such opinions can be shaped, but at first they must be well understood, highlighting the need for further research on dog owners’ perceptions of technology for pets.

References


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