Designing Mediated Nurturing Play with Dogs to Alleviate Workplace Stress

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Abstract

Workplace stress is an ongoing concern for individuals, employers and communities, calling for innovative interventions. Benefits of play therapy, animal-assisted activities, and nurturing are well documented, yet workplaces restrictions often prevent unconventional solutions (such as bringing dogs to work) from being applied. To overcome these restrictions while taking advantage of recent research, we introduce a human-computer-animal interactive nurturing play system, aiming to alleviate workplace stress while minimising workplace disruption. Our proposed system connects workers with remote rescued dogs in nurturing play interactions, with the added benefit of promoting dog wellbeing. Through our current work-in-progress, this paper invites further consideration of how interactive technology design may facilitate workplace stress alleviation through remote nurturing play with animals.

Author Keywords

Play; nurturing play; human-animal interaction; workplace stress; stress management;

ACM Classification Keywords

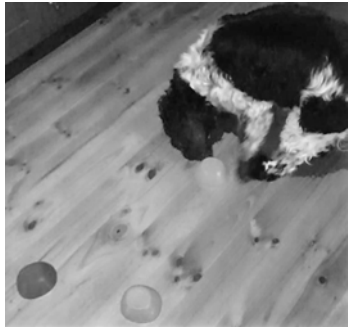H.5.m. Information interfaces and presentation: H.2 User Interfaces.

Figure 1 Local Playtest 1. Find Food Game

Figure 2 Local Playtest 2 -Car Disinterest

Figure 3 Local Playtest 3 - Full Laser Focus

Introduction

Prevalence and impact of worker stress, defined as continuous negative strain in the workplace [1], indicates a need for innovative alleviation approaches because existing options are often inconvenient or inaccessible [2]. Using human-computer-animal interaction (HCAI), we investigate stress alleviation impact of nurturing play on workers, with the added benefit of promoting dog wellbeing. Nurture refers to caregiving, characterized by soothing, protecting, teaching and generally ensuring wellbeing of another [3]. Play, meanwhile, refers to intrinsically-motivated absorption, known as Csikszentmihalyi's flow [4]. Nurturing play therefore combines nurture and play concepts, such as when a parent plays with their child, or a pet owner plays with their pet.

Related Work

Human nurturing touch behavior such as stroking and touching is important in building communal trust and communication [5]. Oxytocin, linked to nurturing social interactions, is also associated with stress alleviation [6]. Breastfeeding in mothers, for instance, correlates with lower stress, and higher oxytocin [7]. While causality is not established between oxytocin and stress alleviation, it is a starting point for further investigation into benefits of being a nurturer. Furthermore, we are inspired by research that showed that stress alleviation through nurturing touch with a robotic seal virtual pet was demonstrated in dementia patients [8]. However, of the studies that exist into

nurturing, few focus on workplace stress alleviation. Meanwhile, active play at work has been shown to alleviate nurse stress [9] and play therapy helps children facing stressful situations [10].

We note that while animal interaction benefit in stress alleviation is evident [11], bringing pets into the workplace is widely forbidden [2]. However, recent HCAI designs present new ways for human expression of nurturing touch that might overcome this workplace impediment.

The goal of the study is to identify which nurturing play behavior leads to stress alleviation, and can this be achieved without the presence of a live dog. Research into child interactions with dogs vs. robotic dogs (AIBO) found high engagement with both, though there was more engagement with real dogs than AIBO [12]. Research using Nintendo digital pets similarly concluded that while there is companionship with virtual pets (non robotic), it is significantly less than companionship experienced with a real dog [13]. This prompts the question which nurturing interactions the virtual dogs afford.

Human and Dog HCAI Design Considerations

We now describe our current system concept "NurturePlay" that allows office workers to play with remote dogs in order to alleviate workplace stress. In NurturePlay, dogs can familiarize themselves with the play area in advance and can choose whether to respond to a human request for interaction by entering the play area. Video analysis will be used to assess dog comfort. A preliminary local dog playtest was also conducted to test interactions and ensure wellbeing.

NurturePlay Player Interaction

Dog Player: the dog may initiate or respond to worker interaction by crossing from the rest into the play area, sending a vibration to the on worker Smartwatch wristband. The dog may enter or exit the play area at any time. Interaction of human and dog players only occur within the parameters of the play area.

Human Player: Workers interact with the dog using a Smartwatch touch screen app. Play options are displayed as icons on the Smartwatch once play is initiated by the human and the dog confirms willingness to play by entering the play area. Options for play: Nurturing touch (constant soothing pressure) delivered to the dog via the haptic vest, comforting pheromone collar release, throw and fetch play, voice interaction. Stress is measured before and after interaction.

Initial local (in-person) dog-human playtesting with two dogs suggest that dogs respond to their owner's voice, even via remote electronic devices. Further, dogs prefer engaging in chasing games or food reward games using smell, chasing laser lights, or catching a soft toy. When laser lights interrupted an existing game activity, even food was forgotten and light chasing became priority, however, some experts suggest laser usage may cause dog distress [14].

For workers, design considerations include ensuring reuse of the existing work space, reducing work interruption, and respecting work boundaries and restrictions. We consider smartwatches for the workers as they are discreet yet still powerful enough to track indicators of stress such as heart rate while supporting remote play via an app.
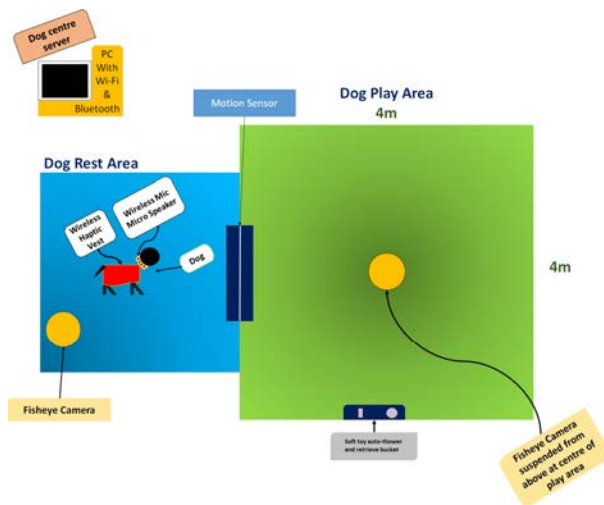

Figure 4: NurturePlay Dog Rest and Play Area

NurturePlay: Proposed Method

The participation worker group will receive access to the NurturePlay and participate in remote nurturing play with a rescued dog. The Control group will play an online nurture simulation game with a virtual dog. Both groups will report stress levels before and after. Once human heart rate exceeds threshold, indicating stress, an alert will be sent to prompt play via an app. Once engaged, humans interact in the following way: monitor, talk, comfort the dog via a pressure haptic vest, engage in comforting via a collar pheromones release, and play using a remote automatic soft toy throwing device the dog can interact with. Dog play and rest area is outlined in Figure 4.

Future Work

NurturePlay could be extended to feeding, bathing and grooming. Nurturing play may even be adapted to improve long term worker stress resilience. An associated future consideration is how to ensure continued worker and animal engagement.

Conclusion

This research presented NurturePlay as a research vehicle to explore aspects of nurturing play via embodied HCAI and its potential to alleviate stress in the workplace. This research is a catalyst for better understanding the wider questions of, firstly, how design can enable nurturing play through HCAI, and, secondly, what aspects of nurturing play are most beneficial to human and animal wellbeing.

Acknowledgements

NurturePlay Components

- Dog rest area, separated by a dog door from attached dog play area.
- Sensor indicating dog movement into play area alerting human player via SmartWatch.
- A fisheye lens suspended over the center of the dog play and rest areas will record dog behavior and comfort and allow human viewing.
- Dog haptic vest for remotely transmitting constant calming pressure.
- Calming pheromone collar with in-collar speakers.
- A server and Wi-Fi at the rescue shelter work site connects components wirelessly and stores interaction data.
- Worker Smartwatch with heart rate monitor, interaction app, alerts, microphone and speakers.
- Remote human controlled soft toy throw device and retrieve bucket.

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