THE IMPACT OF OWNER AGE ON COMPANIONSHIP WITH VIRTUAL PETS

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Abstract

This paper focuses on issues of interaction with a particular type of mobile information system – virtual pets. It examines the impact of owner age on companionship with virtual pets, and tests the hypothesis that younger virtual pet owners will experience closer companionship with their virtual pet than older owners. This is in response to the marketing stance adopted by virtual pet manufacturers who clearly target younger people as the main consumers of their products. The hypothesis was tested using survey data and companionship was measured using the Comfort from Companion Animals Scale. Support was found for the hypothesis at all definitions of young: there is a highly significant difference between the companionship offered by a virtual pet to young people than that offered to older people. Although this finding generally indicates that virtual pets offer more, in terms of emotional-engagement, to younger people than older people we suggest that much more research in this area is needed in order to better understand the phenomenal commercial success of virtual pets. In addition, there is an abundance of literature examining the benefits of owning real pets. It is possible that a virtual pet might be able to deliver some of these, and given our result, it is likely that virtual pets will be more likely to bring these benefits to young people rather than to old people.

Keywords: virtual pets, mobile information system, companionship, artificial companions.

1   INTRODUCTION

This paper focuses on issues of users interacting with a particular type of entertainment-oriented mobile information system – virtual pets. Virtual pets started to gain worldwide popularity in the late 1990s when Japanese toy manufacturer Bandai released the Tamagotchi. About the size of a key ring, a typical Tamagotchi had a small black and white screen, three buttons, a speaker, a motion sensor and a microphone. Users could feed, clean and play with their Tamagotchi, call it via the microphone and chase away predators by shaking the unit. The pet would evolve over time and would eventually either die or fly away. It is clear that many users became attached to their pet, with many actually mourning its death (see for instance: http://starbulletin.com/97/06/18/features/rant.html, and the virtual pet cemeteries at http://www.geocities.com/Heartland/Plains/2188/ and http://www.d-3.com/deadpet/, and even some real cemeteries (Bloch & Lemish, 1999)).

A set of fundamental, unanswered questions is what benefits, companionship, or enjoyment do users gain from owning a virtual pet? Compared to the scarcity of published work in this area, there is an abundance of long-standing literature examining the benefits of owning *real* pets (e.g. Garrity *et al*., 1989; Silverman, 1985; Mahalski *et al*., 1988). For instance, studies have looked at how pets can alter the interaction between people when they meet for the first time (Wells, 2004; Hunt *et al*., 1992), how pets can help overcome the death of a close one (Adkins & Rajecki, 1999) and how owning a pet can be of benefit in a child's development (Pattnalk, 2004). It might be thought, and it is often claimed by toy manufacturers (see below), that a virtual pet could deliver some of these benefits, but to our

knowledge, no studies have actually examined this. Some literature on the design of virtual pets has appeared (for example: Kaplan, 2000; Breazeal, 2004; Kusahara, 2001; Bryant, nd) and, whilst human-virtual pet interaction has been described in the popular press (e.g. Hafnew, 2000; Herold, 2005), very few academic papers have examined the benefits of interacting with one.

This paper addresses the question of whether younger virtual pet owners experience a different emotional response with their pet than older owners. This is in response to the marketing stance adopted by virtual pet manufacturers who clearly target younger people as the main consumers of their products. In particular we are interested in the notion of companionship with virtual pets. The idea that real pets are often treated as *companion animals* is well known in animal behaviour science – in this paper we are interested in the relatively over-looked notion of companionship in virtual animals, or pets. We view this work as a further step to understanding the benefits and/or enjoyment that all users might gain from owning a virtual pet. However, we are particularly keen to understand whether young people use virtual pets for the same, over-lapping or completely different reasons to older people. Our study examined the scores generated by both adult and younger virtual pet users in completing a well established companionship measurement questionnaire which has previously shown that virtual pet owners do experience some feelings of shared companionship similar to that gained from real pets (Chesney & Lawson, in press). What might constitute 'young' in this study is deemed to pivot around 18 years old; however, various definitions of 'young' are tested for.

2 BACKGROUND: FROM TAMAGOTCHI TO AIBO

Tamagotchis were successful despite the fact that the pet did not look much like a real animal. The more recent game Nintendogs, released by mainstream Japanese video-games manufacturer Nintendo early in 2005, is a more advanced version of the same idea. Users run the Nintendogs software on the handheld games-console, the Nintendo DS, which features two full colour screens, one of which is touch sensitive. Nintendogs shows players (or owners) their virtual, animated puppy, (their "Nintendog") which they must feed, water, walk, play with and train. The touch sensitive screen of the Nintendo DS enables users to 'touch' and stroke their Nintendog. Unlike a Tamagotchi, a Nintendog appears visually realistic, exhibits some real animal-like behaviours, and will not die. Nintendogs has been an extremely successful product for Nintendo – with in excess of 7 million sales worldwide to-date. Nintendo have reported (Quilliam, nd) the results of one review of their virtual pet by a relationship psychologist and make the claim that:

> " ... it can not only help develop our attention spans and motor skills, but also improves our ability to solve problems and think creatively .... teaches us how to bond and provides us with a sense of nurture and responsibility ....[and has] emotional effects, helping to raise self-esteem and develop strategic thinking"

However, it should be noted that this study has not been published as a peer reviewed publication.

The long-running game-series Petz, which includes Catz and Dogz, has many similarities with Nintendogs, though in fact it predates that game by almost 10 years, the first release of Dogz by PF Magic/Virgin Interactive Entertainment being in late 1995. Curiously however, the Petz series has only managed sales figures of around 2 million since its release. However, the current publisher of the series, Ubisoft, seems about to attempt to exploit the success of Nintendogs with a release of Catz and Dogz for the Nintendo DS in late 2006. In a recent interview (Gamasutra, 2006), Ubisoft's Petz Executive Producer Tony Van echoed similar high-reaching claims as Nintendo in stating that:

> "one value I always suggest is the player learning how to best take care of their pet, which translates to its use in the real world. This is valuable to both kids and adults, and if it results in one less abused animal in this world, that makes my job even more rewarding"

Such a claim is remarkable – that by playing a computer game which involves caring for a virtual pet, people are able to train themselves to care for, and improve the welfare of, real animals. At present, such claims are based at best on anecdotal evidence.

What is clear, from the marketing strategies adopted by the publishers, is that virtual pets such as Tamagochis, Nintendogs and Petz are primarily aimed at children as end-users. As such, the price of such games remains relatively low - Tamagotchis currently retail for under £15, Nintendogs for £30, and the Windows PC version of Dogz for less than £10. Sony Entertainment's Aibo could be described as an "embodied" robotic version of Nintendogs or Dogz. Significantly, however, Aibo's price tag at around £1,400 (before it was discontinued early in 2006) indicate that it was not targeted at children. Similar, much cheaper, systems inspired by Aibo have appeared, such as the i-Cybie, Teksta Puppy, and Wow Wee's RoboPet, though these devices have not shown significant impact in the marketplace. One embodied virtual pet product which continues to have commercial success is the Furby by Hasbro/Tiger-Electronics. Furby, although by no mean as sophisticated as Aibo, is able to interact with its owner using speech and basic behaviours, and has proved extremely popular with both adults and young people. Indeed, some manufacturers clearly believe that there is a genuine adult marketplace for certain virtual pets, and especially embodied ones, whilst casual observance of web-based user-forums discussing all virtual pets indicates that there are a significant number of adult owners in existence. For instance, since its creation in 1999, the Adult Lovers of Furby (ALOF) user-forum has had over 85,000 posts, with each week seeing over 100 new posts by its current members (see: http://groups.yahoo.com/group/ALOF/).

3   METHOD

We wanted to determine whether younger people experience closer companionship with their virtual pet than adult owners. In order to do this, we deployed a well-known questionnaire-based measure to determine companionship from animals which has also been used to measure similar feelings in virtual pets (Chesney and Lawson, in press). The chosen questionnaire is the Comfort from Companion Animals Scale (CCAS; Zasloff, 1996) which is shown in Table 1. This scale is more generalisable to pets other than dogs (such as cats and birds, and in this case, virtual pets) than other attachment measures (such as Johnson *et al.*, 1992 and Lago *et al.*, 1988). When using the scale, participants are asked to state how much they agree or disagree with 11 items using a 4 point Likert scale with anchors from strongly agree (score of 4) to strongly disagree (score of 1). The 11 scores are then summed to give a participant's overall CCAS score.

1. My pet provides me with companionship
2. Having a pet gives me something to care for
3. My pet provides me with pleasurable activity
4. My pet is a source of constancy in my life
5. My pet makes me feel needed
6. My pet makes me play and laugh
7. Having a pet gives me something to love
8. I get comfort from touching my pet
9. I enjoy watching my pet
10. My pet makes me feel loved
11. My pet makes me feel trusted

Table 1 The Comfort from Companion Animals Scale

To obtain participants, we actively recruited respondents from online virtual pet fora. As embodied virtual pets tend to be more expensive than screen-based ones, owners of screen based pets tend to be younger than owners of embodied pets. Therefore to get a wide age range of owners, the sample

included owners of screen based and embodied pets. 605 emails were sent to owners of Nintendogs with a response of 83 (14%). 152 emails were sent to AIBO owners with a response of 40 (26%). All owners were asked then to complete the CCAS survey. Analysis of the results was then undertaken to test the hypothesis that virtual pets offer younger owners more companionship than older owners.

4 RESULTS & DISCUSSION

Using the data from the Nintendog owners only, CCAS achieved a Cronbach's alpha score of 0.95 and demonstrated excellent factorial validity as shown in Table 2, explaining 70% of variance. Data about the respondents is shown in Table 3. A one-way-anova was used to test the hypothesis. Results are shown in Table 4. The definition of young was varied between 16 and 22. As can be seen, support is found for the hypothesis at all definitions of 'young': there is a highly significant difference between the companionship offered by a virtual pet to young people and that offered to older people and hence we can conclude that, for our study, we demonstrated that young people gain more companionship from virtual pets than older people.

This finding is mitigated by several factors. Firstly, we are aware, of course, that younger people are naturally drawn to play as a developmental mechanism and also that computer and video games can clearly facilitate this. There is an open debate over the effect of computer games on childhood and adolescent development and, although a discussion of this debate is outside the scope of this paper, we note that some studies (e.g. Durkina and Barber, 2002) have revealed positive effects of game-play that may, in future, go on to support some of the currently unfounded claims of virtual pet game publishers with regard to the transferral of experiences within the game to real life. Subrahmanyam *et al.* (2001) briefly discuss the notion of the shift from real life to simulation (and vice-versa) in the context of virtual pets but merely conclude that systematic research is needed to assess the impact of such technology on children.

Item	Factor 1
1	0.87
2	0.87
3	0.79
4	0.87
5	0.76
6	0.72
7	0.88
8	0.86
9	0.82
10	0.88
11	0.86

Table 2 Factorial validity, the extraction method was principal component analysis, extracting eigenvalues over 1

	Screen based pet	Embodied pet
n	83	40
Mean age	17	34
Mode age	14	35
Lowest age	6	13
Highest age	64	74

Table 3 Information about respondents

A related question is whether children and younger people in general are more likely to be more anthropomorphic about technology than adults – and hence whether they might score higher on a companionship scale originally developed for real (although non-human) animals. However, Chiasson and Gutwin (2005) partially tested the well known media equation theory of Reeves and Nass (1996) with children and concluded that contrary to their expectations there was no evidence that children were significantly affected by social characteristics in software, and that adults were influenced in only a few cases. Additionally, Turkle (2005) attempted to contrast the reactions of older people and children to examples of commercial embodied virtual pets (including Aibo and Furby) in a series of ethnographic studies, but indeed found a range of individual, rather than systematic age-related, differences in how relationships were formed.

Definition of young	Young owner			Old owner			
	n	Mean	SD	n	Mean	SD	F
<=16	60	34.60	7.48	63	29.98	6.08	0.00*
<=17	62	34.59	7.48	62	29.84	5.97	0.00*
<=18	65	34.63	7.32	58	29.55	5.97	0.00*
<=19	69	34.38	7.26	54	29.50	6.05	0.00*
<=20	73	34.29	7.25	50	29.24	5.89	0.00*
<=21	74	34.17	7.27	49	29.30	5.94	0.00*
<=22	76	34.01	7.24	47	29.36	6.06	0.00*

Significant at 1%

Table 4 Hypothesis testing

Finally, our study, in order to achieve a balance between young and older people, intentionally mixed Aibo owners with Nintendog owners. These are clearly different types of electronic pet: an Aibo is an embodied robotic device whilst a Nintendog is a screen-based character. The importance of embodiment in a virtual pet, or indeed any autonomous agent, is currently not clear – though a strong trend in human-computer interaction is the development of human-robot interaction strategies which distance themselves from universally criticised screen-based agents such as the Microsoft Office assistant. However, Bartneck (2003) has found that embodiment has no impact on enjoyability, or on how people perceive emotional expression (Bartneck *et al.* 2004). Such work may hint that embodiment may have no impact on companionship. Further research is currently examining this hypothesis. Current data is limited, however it suggests that there is no difference in the companionship offered by an embodied pet and a screen based one, when age is removed from the analysis.

5   CONCLUSIONS

Very little work has investigated why people buy and interact with virtual pet products. This is somewhat surprising given the enormous commercial success of such products. Isbister (2006) attempts to rationalise peoples' motivations for engaging with a virtual pet and suggests that the objective (at least in terms of game-play) is to enjoy the pet's development as well as its moments of both connection and *resistance* to the player. In this way she identifies that virtual pets are relatively unique as autonomous agents in games since they evoke a high degree of *time* and *emotional investment* from the player. Mival *et al.* (2004) when discussing the design of artificial companions for older people suggest that the inherent characteristics of a *companion* transform an interaction into a relationship and evoke an emotional investment.

Our study, using a questionnaire-based measure, showed that younger virtual pet owners experienced higher values of companionship with their virtual pet than did older owners. This was true for all

definitions of 'young' people in our study. Although this finding generally indicates that virtual pets offer more, in terms of emotional-engagement, to younger people than older people we suggest that much more research in this area is needed in order to better understand the phenomenal commercial success of virtual pets – both for older and younger people. In particular, the transferral of simulated to real-life (and vice-versa) experience in the context of virtual pets requires careful study – especially in light of some of the current claims of the games industry.

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