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Engagement in leisure pursuits that involves the use of tools and objects and the exploration of a new environment can provide a success experience that leads to increased feelings of competence and mastery. Such experiences are considered important in the rehabilitation of forensic clients.

The findings from videogame research within a general population are compared with those among mental health and forensic clients. Within the general population, videogames may provide opportunities for social interaction and the expression of creativity and humour as well as offering a graded approach to building computer skills. Within a forensic population, videogames have been found to be a normalising, age-appropriate and culturally appropriate activity, useful in engaging clients and improving self-concept and locus of control.

The findings suggest that videogame play offers access to a safe virtual environment that encourages exploration and mastery and that it may be a useful therapeutic tool in secure settings where such opportunities are often limited. The use and potential contraindications of videogames within a forensic setting, the content of certain games and their possible influence on behaviour and the implications for future research are also discussed.

The Therapeutic Use of Videogames within Secure Forensic Settings: a Review of the Literature and Application to Practice

Phil Gooch and Ruth Living

Introduction

Occupational therapy and leisure

In a newly revised definition of occupational therapy, the College of Occupational Therapists has noted:

The main aim of occupational therapy is to maintain, restore or create a match, beneficial to the individual, between the abilities of the person, the demands of her/his occupations in the areas of self care, productivity and leisure, and the demands of the environment (COT 2003, p8).

Within the occupational therapy literature, leisure has been regarded as a core human occupation, essential to physical and psychological wellbeing, since the beginning of occupational therapy practice (Meyer 1922, cited in Suto 1998, Farnworth 2000). One aspect of leisure – play – has for a long time been recognised as developmentally important in children: being bounded by rules and conditions, play allows the child to adapt to the external environment, to discover how to use tools to operate on the environment and to practise taking on social roles without exposure to the consequences that might threaten survival (Kielhofner and Miyake 1981). Playing games equips children with the social skills needed to adapt to the requirements of a society (Greenfield 1993).

The profession has only recently, however, considered adult leisure and play seriously (Suto 1998, Lobo 1999,

Farnworth 2000, Hodgson et al 2001). For older adults, playing games is accompanied by a sense of belonging, continuity and mental and physical health (Hopkes et al 2001). For younger adults, leisure promotes personal development and positive mental health outcomes and prepares the young person for the worker role (Passmore 1998).

Videogames as a leisure activity

It has been suggested that, as a result of man's increasing reliance on technology in the workplace, the focus for personal development and maintenance of self-identity and self-worth has shifted from work to leisure (Suto 1998, Iso-Ahola 1980 cited in Bryce 2001). At the same time, technology has influenced the choice of leisure occupations: the invention of photography and motion pictures, the development of private and public transport from the automobile to the aeroplane, and the advent of the television, the video, the computer, the games console and the Internet (Bryce 2001).

The occupational therapy literature considers leisure along the three axes of occupation/activity, time and subjective experience (Suto 1998, Lobo 1999). However, in the emerging leisure studies literature, a fourth axis is considered: leisure spaces (Bryce 2001). Changing technologies have brought about changes not only in the types of leisure activity in which one engages but also in the

spaces – the physical and social environments – in which leisure occurs.

The development of videogames, email and the Internet has seen the rise of the virtual leisure space. Within this virtual technological space, videogames are reproducing (and to a certain extent replacing) traditional games (Bryce 2001). Videogames are certainly a popular leisure activity: 73% of 7-29 year olds have played them, with 25.8% playing games every day and 47.6% playing games most days. Worldwide, there are over 100 million computer games consoles (Digiplay 2002). Once regarded as the domain of 10-18 year old males, recent market research by the United Kingdom's largest game retailer suggests that the majority of videogame players now fall into the 20-35 age-range, with 20% being female (Steinbrecher 2001). The social and cultural importance of videogames is beginning to attract serious academic research (Squire 2002) and the Barbican Centre, a prestigious arts centre in London, has recently hosted a major exhibition on the videogame phenomenon (Barbican 2002).

Occupational therapy and forensic clients

Forensic psychiatric patients have low volition and spontaneity (Lloyd 1987). Volition is based on the urge to explore and master the environment (Lloyd 1987) and relates to how effective and competent a person feels in interacting in his or her environment, based on expectations and experiences of success and on interests and values (Kielhofner 2002). Occupational therapists working in the forensic field use and manipulate the environment to assess risk and to help clients to develop coping skills (Chacksfield 1997). The impact of the environment on therapy and gaining client engagement in individual and group activities are top priorities for forensic occupational therapy research (Mountain 1998, COT 2002).

A major goal of occupational therapy with clients in a forensic setting is to improve their capacity to experience feelings of control (Farnworth 1987, cited in Mountain 1998). Through exploratory behaviour, a sense of self-competence and self-efficacy is achieved, with exploration being the first stage of therapeutic change (Kielhofner 1995, 2002). Bandura (1976, cited in Perkins 1998) found that patients' perceptions of their ability to handle situations – that is, their self-efficacy – could lead to therapeutic change.

Forensic clients, being held in a secure and restricted environment, are limited in their opportunity for mastery experiences and, thus, the innate urge for mastery and exploration is stifled (Lloyd 1987). Following the recommendations of the Fallon Inquiry into Ashworth Special Hospital (Fallon 1999), forensic clients are also restricted in their access to one of the emerging and increasingly important virtual leisure spaces discussed above, that is, the Internet. Although the age-range is wide, the average age of the forensic clients is around 30 years, with a male to female ratio of 4:1 (Badger et al 1999). This age demographic is similar to that of the typical videogame player as noted above, suggesting that videogames may be a leisure activity of interest to this client group. This may have yet to be fully capitalised on by occupational therapists.

Theoretical perspectives: active leisure

Researchers have divided leisure occupations into active and passive activities. Active leisure is conceptualised as activities that develop competencies, skills and enhanced self-esteem, whereas passive leisure is believed not to have these effects (Passmore 1998). Others have considered leisure as being either 'serious', that is, involving achievement, personal development and feelings of group identification and immersion in a subculture, or 'casual', that is, used to pass the time (Suto 1998).

The importance of active leisure among forensic clients

Farnworth (2000) studied the time use and leisure occupations of young offenders. Following Passmore (1998), she divided leisure use into active/achievement/social (those that developed competencies and influenced self-efficacy and self-esteem) and time-out/passive (those that did not enhance either competence or self-esteem), and classed computer games as an active leisure occupation (in common with others, for example, Bryce 2001). Farnworth (2000) found that young offenders spent the majority of their time engaged in passive leisure occupations (such as watching television and listening to music) at the expense of engaging in active leisure occupations; this was as a result of their perceived lack of ability and lack of opportunity as well as their disrupted occupational history. Farnworth (2000) suggested that such occupational dysfunction may influence negatively the mental health and wellbeing of young offenders.

For clients with a dual diagnosis of a mental health disorder and substance misuse, engagement in active leisure may be a key factor in the recovery process (studies cited in Hodgson et al 2001) and may also be a useful relapse prevention strategy (Hodgson and Lloyd 2002).

Normalising occupation with forensic clients

The use of tools is a key feature of occupational engagement. In prison, the lack of access to tools reduces opportunities for occupational engagement and environmental mastery, leading to a stagnation or deterioration of capacities (Molineux and Whiteford 1999). At the same time, tools and objects provide a sense of individual and group identification, with a cultural meaning and value attached to them (for example, cars and stereos among young adults) (Kielhofner 2002). The videogame console can be regarded as a tool for accessing normal and contemporary leisure spaces (Bryce 2001), providing both opportunities for exploration and group identification.

The 'flow' experience

Positive experiences in active leisure have been conceptualised as an optimal experience or 'flow' (Csikszentmihalyi 1988), a transcendent experience of intense involvement and an optimal balance of challenge and skill, in which a feeling of

control and mastery over the activity is achieved. These concepts have been used to describe the common features of engaging in valued occupations, be they work, training, or leisure and sport. Recently, the experience of flow has been extended to computer use and videogame play: initial research suggests that the psychological experience of videogame play is comparable with the experience of participating in competitive sporting activities (Bryce and Rutter 2001).

Coping strategies for those in a restricted environment

Within certain aspects of forensic occupational therapy, particularly acute care and the treatment of addictive behaviours, relaxation training and the development of coping skills are regarded as key interventions (Mountain 1998). Active engagement in creative leisure may help patients with chronic disabling conditions to cope (Reynolds 1997, Suto 1998).

The ability to explore virtual environments through videogames may be therapeutic for those who do not have the opportunity to explore the real physical environment (Taylor 2002). Pratt (2001) described how, when recovering from abdominal cancer, playing an exploratory videogame (*Zelda: Ocarina of Time*) enabled him to cope with long periods of inactivity and to engage with the game environment in ways that were denied to him in the physical environment:

I could learn at my own pace ... in a gentle and non-threatening way... Playing [the] game gave me a new sense of determination ... I could do all the things denied me in reality, like running around, climbing and interacting with my world. I truly believe that this game got me through the worst of my illness (p128).

Such anecdotal use of videogames in this way reflects Kielhofner and Forsyth's (2002) suggestion that exploration in a relatively safe environment allows new objects, spaces, social groups and occupational forms to be investigated.

Other studies have suggested that videogames might have a role in relaxation training (Di Bona and Boyle 2001, BBC News Online 2002a).

Graded occupation to improve technical skills and build self-esteem

Anxiety and apprehension when confronted with a computer are well documented (Tseng et al 1998). The high societal value placed on computing and technical skills, with its association with the workplace (Grogan 1994), may make such anxiety more likely in people with mental health needs. It has been claimed that the use of computers builds self-esteem and a sense of competence (Grogan 1994, Stern et al 1999). Videogame play may therefore be a useful way of grading the introduction to computer use in general (as suggested by Greenfield 1993) and, through exploration of the virtual environment, increase feelings of self-competence and provide an improved locus of control and self-concept (Kappes and Thompson 1985).

It has also been suggested that videogame play may improve self-esteem in those with behavioural problems (Spence 1988).

The use of videogames could therefore prove to be a normalising and therapeutic occupation that is beneficial to clients in a forensic setting.

Videogame research

A journal index and online database search was conducted covering the period 1985-2003; the search strategy is detailed in Appendix 1.

Videogame research within a well population

Research suggests that there are both positive and negative effects of videogame play. The literature is extensive and is reviewed in some detail below.

The effects of violent videogames: catharsis or reinforcing learnt behaviour?

The issue of violence in videogames has been the subject of much debate and, until recently, the majority of research in the psychosocial literature was focused on the possible detrimental effects of videogame play, particularly on children. Griffiths (1999) carried out an extensive literature review on videogames and aggression. He noted two theories of the effects of videogame play:

1. Social learning theory, in which playing aggressive videogames would lead to actual aggressive behaviour
2. Catharsis theory, in which videogames release aggression in a non-destructive way, relaxing the player.

Observational studies on young children's free play following the playing of aggressive videogames seem to support the social learning theory: in the short term, at least, children's aggressive behaviour appears to increase (studies cited in Ballard and Wiest 1996, Griffiths 1999).

The effect of violent videogame play on young adults is, however, inconclusive. Experimental laboratory studies on university students have shown inconsistent results. Ballard and Wiest's (1996) study of male undergraduates, playing either a billiards videogame or one of two versions of *Mortal Kombat* (a controversial martial arts videogame featuring graphic violence), showed that both levels of systolic blood pressure (a measure related to levels of hostility) and scores on the standardised Buss-Durkee (1957) hostility inventory were significantly related to the level of violence in the videogame. However, Ballard and Wiest's (1996) sample was small (n = 30) and there was no suggestion that these physiological changes and hostility scores led to any changes of *actual* behaviour: such responses could support equally social learning theory or catharsis theory. Scott (1995) carried out a similar, but larger, study of 42 men and 75 women and found no relationship between levels of game violence and hostility scores, or any gender effects. Other similar studies (cited in Griffiths 1999) found no differences in hostility scores or in cardiovascular response.

Some researchers now suggest that the issue is more that exposure to videogame violence primes an individual to expect hostile outcomes to life situations. Bushman and

Anderson (2002) studied the responses of 224 male and female undergraduates to three fictional scenarios following a random assignment to play either violent or non-violent games and found that those who played the violent games elicited more aggressive responses to the scenarios ($p < 0.007$). However, a number of the responses categorised as aggressive by the authors could equally, in the context of being 'in the game' (Bryce and Rutter 2001), have been categorised as humorous (for example, 'What a dumbass!' and 'This place sucks!'), a theme noted in the ethnographic study by Wright et al (2002) of online videogame players (see below).

Self-report and peer report studies of videogame violence are inconclusive, showing a mixture of increased aggression (as measured by questionnaires and standardised hostility adjective scales), no effect or a calming effect (Griffiths 1999). Those showing a relaxing effect could be regarded as evidence for catharsis theory, a view shared by some mental health professionals (Kestenbaum and Weinstein 1985). However, these studies tended to look at videogames in general and did not distinguish between different types of game. Griffiths (1999) noted the need for a taxonomy of videogames: some violent games may indeed have negative effects whereas other types of game, for example those that involve exploration or solving puzzles, may have more positive benefits. Understanding such dynamics would allow a therapist in a forensic setting to make appropriate games available and determine their best use.

Competition vs cooperation

It is also recognised that the competitive nature of certain games that involve win or lose situations could lead to increased aggression. Anderson and Dill (2000) studied 210 college students playing either a violent and competitive (*Wolfenstein 3D*) or a non-violent and non-competitive (*Myst*) videogame. Those who lost the violent game punished their opponent with a statistically significantly (0.16 seconds) longer blast of noise than those playing the non-violent game. However, there were no differences between those who won *Wolfenstein* and those playing *Myst*. It is also unclear how a 0.16 second difference in noise blasting is clinically significant or how it relates to actual behaviour.

In comparison, research into competitive social activities in general suggests that *competition* may be the precursor that promotes arguments and aggressive behaviour (Anderson and Morrow 1995); in sport, aggression may increase with the frequency of competition (Widmeyer and McGuire 1997) and frustration with losing in team or individual sports may trigger aggressive reactions (Martin 1976). The use of videogames may, therefore, be no different in this respect from more frequently used interventions.

Social interaction

Media concern that the increased use of videogames may decrease participation in other activities and lead to social isolation (Colwell et al 1995, van Schie and Wiegman 1997) is unsupported by published evidence. Mitchell (1985, cited in Squire 2002), in a study of 20 families, found that games consoles were used as a shared play activity, reinforcing

family interactions positively. In the survey by Colwell et al (1995) of 120 adolescents aged 11-17 years, despite (or perhaps as a result of) weighting their questions with the assumption that videogames are a solitary activity ('Playing computer games is a chance for me to be by myself' and 'Playing computer games helps me forget I'm alone'), it was found that frequent videogame players reported socialising with friends outside school more than less frequent players. The survey by Barnett et al (1997) of 229 15-19 year olds also noted the social aspect of videogame play: the respondents tended to play games that were socially involving, included team competition and were played by their friends.

Van Schie and Wiegman's (1997) survey of 346 10-14 year olds found no evidence that videogame play was occurring at the expense of other leisure activities or social integration. Robinson and Kestenbaum's (1999) survey of 6000 young adults (aged 18+ years) found that 40% used a personal computer for games and Internet use yet increased use of the computer was significantly related to *increased* participation in cultural and arts activities, although the correlation was quite weak.

Creativity and humour

The ethnographic study by Wright et al (2002) of the in-game talk of online *Counter Strike* players found that, within the complex subculture of insider slang, etiquette and technical expertise – mastery of which was necessary to gain recognition and respect within the group – a huge amount of creative and humorous use of language and visual play occurred. Humour was used self-deprecatingly, to soften insults so as not to cause offence and to defuse tensions that arose through misunderstandings and mistakes. Through such exchanges, the players learnt the expected norms of both game and social behaviour while at the same time experimenting safely with violating those norms (Wright et al 2002). Such use of humour has also been recognised in the occupational therapy and nursing literature as an important therapeutic tool that can have a transformative power to reframe conflict and to humanise difficult situations (Vergeer and MacRae 1993, Fleming 1994, Struthers 1999).

Mastery and self-esteem needs

Technological mastery is seen as increasingly important in modern society (Neumann 1986). Those without computer skills may become socially disadvantaged and excluded from the job market (Di Bona and Boyle 2001). It has been suggested that mastering an activity that is highly valued in a culture leads to heightened self-esteem (Erikson 1963, cited in Neumann 1986) and that achieving a mastery experience through the use of a computer will improve a person's sense of competence (Neumann 1986). Videogame play may also provide a mastery experience and may improve the sense of competence in those who feel lacking in competence in other areas (Kestenbaum and Weinstein 1985). The skills developed through videogame play may also be directly transferable to the technological competence required for computer literacy (Greenfield 1993).

Surveys of normal adolescents and young adults appear to show no relationship between the frequency of home videogame play and self-esteem (Colwell et al 1995, Barnett et al 1997), although some researchers have found such a relationship among those who play arcade videogames (for example, Dominick 1984 cited in Colwell et al 1995, Kestenbaum and Weinstein 1985); however, as arcade games involve monetary loss and reward in the form of extended play and high scores, different needs may be being satisfied there.

Some authors assert that success at videogame play has a compensatory adaptive function in males with low self-esteem (for example, Long 1983 cited in Colwell et al 1995). However, as noted by Colwell et al (1995), these authors equate frequency of play with success, which might not necessarily be the case; what is needed is an investigation of successful game-play and measures of self-esteem.

Technological competence

Certain simulation and puzzle-solving games (for example, *Sim City*, *The Sims*, *Settlers* and *Age of Empires*) have been claimed to stimulate learning in 7-16 year olds (BBC News Online 2000a, 2002b). However, Squire (2002) noted that research on the transfer of learning in one context to performance in another context (the 'transfer problem') suggested that the cognitive skills learnt through computer games were not generalisable to other contexts and were only useful in similar contexts – in this case, better performance at similar games. Greenfield (1993), while agreeing that skill in videogames did not transfer to general inductive reasoning ability, claimed that the medium-specific skills acquired from videogames were their strength because they prepared individuals to deal with the world of computers in general.

An important aspect of videogames is their use of iconic representation of spaces, rules and processes. Computer literacy requires similar skills in discovering the meaning behind the windows and icons of modern software interfaces. As a result, fluency with videogames provides the iconic representational skills required in today's technological society. The ability to find one's way around a computer game, where the rules are discovered by playing the game, may be directly transferable to skill in finding one's way around computer software in general (Greenfield 1993). As such, in providing the technological skills needed in today's workplace, videogames can be considered to fulfil one of the criteria for active leisure.

The use of videogames in the normal population suggests that, on balance, they promote opportunities for social interaction, creativity and humour, and building technical skills. Although questions remain about their impact on aggressive behaviour, it is known that videogames are currently being used in general mental health settings, which serves as a useful point of reference in considering their use within a forensic setting.

Videogame research within mental health settings

The therapeutic use of leisure is a frequent intervention by

mental health occupational therapists (Craik et al 1998). In a questionnaire evaluation of 34 computing sessions completed by 19 clients and 4 staff, Di Bona and Boyle (2001) found that games were the second most common activity (18%) and suggested that computer games and videogames were seen as useful tools for enhancing leisure occupation. They also found that those who played games most frequently identified game playing as a way of relaxing and passing the time; however, no quantitative details were given of this finding and the authors suggested that care should be taken in drawing conclusions or generalisations from their results. Some research also exists on the use of computer games for physical disabilities (for example, Hasdai et al 1998, Jarus et al 2000); generally, there is little published material on the use of this medium in a mental health setting and almost nothing at all on its use in forensic mental health settings. Much of the research is observational, descriptive and in the form of short case illustrations.

Cognitive skills development

Videogames have been used in mental health, cognitive rehabilitation and learning disability settings because of their use of certain cognitive skills: lateral thinking, decision making, concentration, memory and problem-solving skills (Roberts M 1985, Armstrong and Rennie 1986, Roberts C 1986). Unfortunately, despite initial optimism in the 1980s in the use of computers for cognitive rehabilitation, there is no evidence that the exercise of these skills in this way has any restorative benefit or is transferable to other contexts (for example, improvements in short-term memory).

Coping strategies

In line with the basic premise of this paper, the use of computers for promoting coping strategies and leisure may be more promising (McBain and Renton 1997). Falconer (2002) suggested that computer games consoles have an important role in fulfilling leisure needs, providing respite for carers and allowing interaction with family members and peers.

Social interaction

Roberts (1985) described the use of adventure games and gave some case illustrations. She noted that videogames appeared to be successful in engaging withdrawn schizophrenic and psychotic patients: they responded with spontaneous exploration and became less withdrawn.

Similarly, Gardner (1991) suggested that videogames helped to establish rapport in his psychotherapy sessions with children. He described four particular case studies where videogames were used to support psychotherapy in addition to other techniques (for example, story telling, drawing and other games), claiming that it was the videogames that were the most useful factors in the improvement during therapy. It was argued that they provided useful opportunities for behavioural assessment. Others have suggested a similar role for videogames in behavioural assessment and subsequent treatment through increasing motivation, developing cooperative behaviour and raising self-esteem (Spence 1988).

Assessment

Samoilovich et al (1992) looked at the effects of three non-violent videogames (*Tetris*, a puzzle game, and *Breakout* and *Pac-Man*, which require fast reactions) as a treatment activity for chronic schizophrenic patients during individual play sessions. The authors claimed that videogame performance correlated well with the execution part of the Wechsler Adult Intelligence Scale ($r = 0.13$, a weak-to-medium correlation, Cohen 1988), suggesting that these games may have value as an assessment tool, although no measure of videogame performance was given and the sample size was small ($n = 10$). They also claimed that the patients tended to engage more positively with the videogames than with other daily activities on the unit, but no quantitative or qualitative data were given to support this. Samoilovich et al (1992) concluded that videogames were useful because they could easily be graded and could be self-administered. Such self-administration of activity may encourage a greater sense of mastery and control in hospitalised patients (Newman et al 1997).

Specific client groups

Miller (2002) described a study comparing computer therapy with traditional therapy for hospitalised depressed patients. Computer games formed one of the treatment modalities and were found to show significant patient improvement over time compared with traditional therapy.

Biofeedback techniques have been successfully used in videogames to promote relaxation and to treat children with attention-deficit disorder, although the use of games in these contexts is still in its infancy (BBC News Online 2000b, 2002a).

Videogame research within secure and forensic settings

If the literature on therapeutic videogame use in mental health is minimal, published research in secure settings is almost non-existent. In a small study of 12 male residents of a maximum secure facility, Kappes and Thompson (1985) found that individual biofeedback training and videogame play (*Pac-Man*, *Pitfall* and *Donkey Kong*) were equally effective at improving locus of control and self-concept. They concluded that it was the feedback provided by both interventions that led to the improvements because it offered the reward that motivated the participants to improve continually on their performance. However, the small size of the study gives it little statistical power.

Chorlton (1986) described the use of computer adventure games for social skills training for those with chronic schizophrenia at The State Hospital, Carstairs, in which the games involved decision making and working with the consequences. Cooperative participation in computer games with staff led to a more natural interaction between staff and patients. Finlay (1997) described a case illustration of Sharon, a client with a history of substance misuse in a secure forensic unit preparing for community discharge. Sharon's interest in computer games was used in therapy to provide her with a successful experience of being in control: she researched and bought some new computer

games for the unit which, Finlay (1997) argued, helped the therapist to engage Sharon in treatment.

Duncan (2003) suggested that videogames are a culturally appropriate (given a predominantly young male population) and a popular occupation within secure settings. Although they could promote isolation, they may also provide opportunities to promote parallel play, turn-taking and socialisation.

Discussion

Implications for occupational therapy research

Previous descriptive reports of the use of videogames in acute psychiatric and forensic settings have consistently raised themes such as mastery, control and exploration (Kappes and Thompson 1985, Roberts 1985, Chorlton 1986, Finlay 1997). However, no recent published material was found that studied these phenomena, despite the fact that such skills are considered to be prerequisites for therapeutic change in occupational performance (Cubie and Kaplan 1982, Kielhofner 2002).

Quantitative research could use standardised measures of self-efficacy (Schwarzer and Jerusalem 1995) to determine if there are any measurable improvements in feelings of self-efficacy pre-/post-videogame play. Data gathering methods such as the Computer Self-Efficacy Questionnaire (Eachus and Cassidy 2003) could be used to determine if videogame play has an impact on reducing feelings of anxiety around using computers. Such research might then point to the use of videogames as part of a graded approach to the vocational rehabilitation of forensic clients, in line with Greenfield's (1993) proposal that the skill in understanding the iconic representation of knowledge and the processes used in videogame play provides the prerequisites of the technological skills needed in the workplace. If videogame play fulfils Passmore's (1998) criteria for active leisure, then its use with clients with a dual diagnosis (who benefit from active leisure as a coping strategy and to prevent relapse, Hodgson and Lloyd 2002) could be the subject of further quantitative and qualitative research.

Qualitative research, which explores a phenomenon in terms of its meaning to the participants (Greenhalgh and Taylor 1997), might provide some insight into the experience of videogame play among forensic clients. Previous studies on videogames have been descriptive, observational or quasi-experimental laboratory research (Griffiths 1999). Squire (2002) suggested that there was a need for more qualitative research that examined the interactions and experiences of videogame players and the roles that emerged through game play. Similarly, Griffiths (1999) argued that naturalistic field experiments were required because laboratory studies could not examine actual real-life behaviour for ethical reasons. Sherry (2001) noted that field studies would provide greater validity than laboratory experiments because they would acknowledge the role that games played in society and their social settings and meanings.

The COT's (2002) research and development strategic vision and action plan for forensic occupational therapy suggests that gaining the engagement of clients and the impact of the secure environment are priority research topics in the field. In the light of the evidence presented here, researching videogame play from these perspectives might provide useful justification for its (re)introduction as a therapeutic tool for forensic occupational therapists.

Conclusion

The literature reviewed here tends to suggest that videogame play can be an engaging and active leisure occupation that provides an opportunity for the mastery and exploration of a specific environment: the modern virtual leisure space.

Surveys of general videogame play have shown positive correlations with socialisation and possible links with an overall sense of competence. Small-scale uncontrolled studies, case studies and descriptive reports among forensic and psychiatric populations have claimed a variety of therapeutic benefits: relaxation, engagement and exploration, improved self-concept and self-esteem, and as part of a graded approach to improving computer skills.

Passmore (1998) found that active leisure developed the skills necessary for the workplace: commitment, personal control and working cooperatively with others. Kappes and Thompson (1985) noted that videogame play improved feelings of personal control among forensic clients. Such an intervention might be particularly pertinent in the treatment of forensic addictive behaviours, where interventions typically involve the use of active leisure and the development of coping and group interactive skills (Chacksfield and Forshaw 1997).

The concept of videogames as a normalising activity (Bryce 2001) suggests that videogame play might reduce the stigma of incarceration among forensic clients by providing a means by which they can identify with their peer group outside (Kielhofner 2002).

The issue of violent videogames remains problematic. Previous reports on the therapeutic use of videogames with forensic and mental health clients (Kappes and Thompson 1985, Roberts 1985, Chorlton 1986, Samoilovich et al 1992) have not discussed this issue, possibly because such games were not available at the time or because violent acts were depicted in abstract ways as a result of the limitations of the hardware at the time. Given that quantitative studies of violent videogame play among a well population have emphasised possible negative short-term effects (an increased hostile and aggressive affect) whether it is manifested in actual behaviour or not (Sherry 2001), it would make sense to exclude games that feature realistic graphic violence; for example, where the aim is to harm lifelike human opponents with realistic weapons.

Ultimately, the decision about what might be considered harmful will rest with the clinician and would form part of any risk assessment, such as triggers for aggressive behaviour, although the perceptions of what is considered

violent or harmful are subjective and have changed greatly over time (Scott 1995). Using the themes from the literature as guidance, the games presented in Appendix 2 have been selected as providing opportunities for exploratory group, competitive and cooperative play.

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Appendix 1. Search strategy

- Key words 'virtual environment', 'computers and occupational therapy', 'information technology and occupational therapy', 'video games' and 'computer games' in Ovid, using Medline, PsycINFO and CINAHL from 1995.
- Key words 'computers' 'computer games' 'video games' and 'leisure' in OTDBase.
- Index search of following journals from 1995: *American Journal of Occupational Therapy*, *British Journal of Occupational Therapy*, *British Journal of Therapy and Rehabilitation*, *Canadian Journal of Occupational Therapy*, *Occupational Therapy in Mental Health*, *Occupational Therapy Journal of Research*.
- Google search on 'therapeutic use of computers'. This gave links to websites which themselves had reference lists of relevant research.
- BMJ.Com search on 'computers mental'.
- University of London library browse of journal lists and e-journals to find periodicals that may contain research of interest, for example, *Behaviour and Information Technology*.
- Hand searching of recent issues of journals in which relevant articles were found through the above search methods.
- The articles were then filtered for their discussion of computers for leisure and use of computer/videogames.

Exclusion criteria

- Articles about the use of computer games for purely physical rehabilitation, for example, range of motion, motor skills and home environment control systems.
- Articles where the use of the computer was not the sole part of the activity, for example, equipment linked to a computer for taking measurements.
- Articles about the use of computer games with children as an educational and developmental aid.

Appendix 2: Selected games for group or exploratory play

Competitive, non-violent games for two or more players

Playstation

- *Bust a move*: A two-player puzzle game where players compete to launch coloured balls into spaces between descending columns of similar spheres. If the ball matches the adjacent spheres, a row is cleared.
- *Dancing stage Euromix*: A videogame that requires much physical activity. Players carry out progressively more difficult dance moves on a mat linked to the games console in time with the music and following the animated dancer on the screen.
- *Parappa the Rapper*: A two-player music and rapping game. Rap in time to the music by pressing the correct buttons on the joystick in synchronisation to the animated on-screen Parappa to progress to ever more complex beats and lyrics.

- *FIFA 2004*: A football simulation. With realistic graphics, it uses the names of real clubs and footballers to allow participants to play as their favourite team.
- *Gran Turismo*: A racing car simulation with highly realistic graphics and car physics. Players can compete against each other and the computer-controlled cars in their own customised machines.

Gamecube

- *Super Monkey Ball*: A four-player game in which a monkey inside a transparent sphere must be guided through tilting mazes, narrow ledges and increasingly complex environments. Includes mini-games, such as a bowling simulation.

Nintendo 64

- *Wave Race 64*: A four-player speed-boat racing simulation.
- *Space Station Silicon Valley*
- *Mario Tennis 64*: A four-player tennis simulation featuring well-known Nintendo characters.
- *Mario Golf 64*: A golf simulation featuring Nintendo characters. Players build up skills and experience to enable them to progress from simple to more complex and difficult courses and more challenging opponents.

Non-violent, cooperative games for one or more players

Playstation

- *Music 2000*: A music-making program that allows various types of dance music to be created, played and stored on the Playstation console.

Gamecube

- *Legend of Zelda: the Wind Waker*: Sequel to the Ocarina of Time (see below).
- *Animal Crossing*: A multi-player game where one has to nurture animals and explore a vast environment.

Nintendo 64

- *Legend of Zelda: the Ocarina of Time*: A single-player game where one takes the role of Link, exploring the world of Hyrule through various ages. Link ages and develops in wisdom and experience as the game unfolds.
- *Animal Forest*: A single-player game of pure exploration and interaction within a lushly detailed environment.
- *Harvest Moon 64*: A single-player game where one takes the role of a farmer who must plan how best to use his land, buy seeds, plant crops and feed livestock throughout the seasons of the year.

Games that involve two or more players in cooperative play, but which may contain fantasy violence

Xbox

- *Halo*: A four-player militaristic game involving tactical and cooperative play against computer-controlled alien army.

Playstation

- *Baldur's Gate Dark Alliance*: A fantasy role-playing game where players build up experience and skills to enable them to purchase magical items, complete quests and explore a number of detailed environments with their own complex narratives.
- *Neverwinter Nights*: See above.
- *Morrowmind*: See above.

Nintendo 64

- *Gauntlet Legends*: A four-player game where players can choose from characters with different skills and abilities to cooperate in defeating computer-controlled creatures in a magical dungeon.

Gamecube

- *Phantasy Star Online*: A massive, multi-player role-playing game where players can compete or cooperate to complete quests, build skills and explore a complex environment with its own rules and systems.