Journal of
Health, Social and Environmental Issues

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Journal of

Health, Social and Environmental Issues

Volume 4, no 2

Issue Editor: Diane Purchase

Assistant Issue Editor: Paul Lowe

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Foreword

Larry Purnell – Professor and Head of the online Masters programs in Health Services Administration, University of Delaware, College of Health and Nursing Science

I am honored to be asked to write the foreward to this edition of the Journal of Health, Social and Environmental Issues. As I am writing this, I am experiencing flashbacks of the wonderful experiences I had at the Research Centre for Transcultural Studies in Health during my sabbatical from the University of Delaware in 2002. Everyone at Middlesex University and Whittington Hospital was gracious, accommodating, and welcoming. A heart-felt thanks to all.

This issue includes articles of interest for health professionals in clinical practice, research, education, and administration/management. Consistent with Middlesex University and the Centre for Research, futuristic themes emerge: globalization and internationalization in the contexts of environment, technology, culture, public policy, and illness and disease prevention. The articles on conscious robotics and spatial learning made me reflect on my first encounter with "Robbie Robot", a technologically advanced artificial person who delivered documents, supplies and medications throughout the hospital. Robbie worked 24 hours a day, 7 days a week; never called in ill or took a vacation, and did not waste time talking with people about his latest vacation or restaurant experience. He was always courteous and gave everyone a greeting when he entered an elevator or stopped at a work station. Robbie replaced 6 service technicians (they were trained to do other jobs) and I was appalled because I was sure that robotics and artificial humans would cause mass unemployment and had no place in health care. How wrong I was! Since that time, we now use virtual reality for treating phobias and eating disorders and to do gait training to increase performance and make better artificial limbs for children and adults. Robotics is now a part of every day life in some form or another.

Globalization, public policy, illness and disease prevention, internationalization, and culture are evidenced with articles on the DayWater project, worked-based learning projects, and the subculture of alcohol abuse, a worldwide health and social concern. Advances in computer technology and the internet, now a world wide resource, allows people to connect in support groups and researching information for the general public on health and illnesses. Fascinating, that now researchers from around the world can access the same professional literature through MEDLINE, CINAHL, ERIC, and PsychLIT to name a few, and obtain the latest information and position statements of professional organizations. This is true globalization, internationalization, and an online subculture.

I applaud the authors of the various articles, the Editor, Editorial Board, and the technical and administrative staff who have once again produced an edition with valuable information for today and future archives.

Introduction

Diane Purchase,   PhD, MSC, BSc, MBiol, CBiol, PgCHE, Senior Lecturer, School of Health and Social Sciences, Middlesex University

This edition of the Journal of Health, Social and Environmental Issues continues to reflect the diverse and multi-disciplinary nature of the research work carried out in the School of Health and Social Sciences. We present a selection of papers ranging from psychology, patient care and support to treatment of stormwater in Europe. The editorial board is pleased to include several articles written by researchers and students from the school, we hope their positive experience in writing for the journal will encourage others to submit for future editions.

The first article is written by Francis McGuire and Andrew Guppy. They explore the relationship between negative childhood experience and poor adjustment by people with alcoholic parents, especially in terms of maternal alcoholism.

George Sandamas and Nigel Foreman present their research in the next paper: comparing activity and passivity in a virtual environment depicted on a desk-top monitor.

In her paper, Barbara Workman on the applications and methodologies used in Work Based Learning project modules. It compares the 'prescribed' and the 'negotiated' approach.

Lydia Burke and Brian Anthony contribute a paper on the use of internet support groups by people with chronic diabetes by monitoring and studying the activities on an internet newsgroup for people with diabetes mellitus.

Lian Scholes et al describe an EU-funded research project to manage stormwater in urban areas in their article and chart the progress of the project 'DayWater' since its inception in Dec 2002.

Two related articles on artificial consciousness are written by Steve Torrence and Souzi Dracopoulou. In his paper, Steve differentiates between Artificial Conscious (AC) and Artificial Intelligence (AI), and establishes connection a between AC and morality.

Souzi explores the moral and ethical issues related to creating conscious robots as a result of biotechnological advances.

Brian Anthony contributed a book review on 'Key Nursing Skills' by (our very own) Barbara Workman and Clare Bennett.

We also have two reports for the Conference Report Section. The first by Daryl Evans relating events from the 11th Annual Public Health Forum held in Cardiff in March 2003. Another by Lesley Vernon on the Royal College of Nursing Annual International Nursing Research Conference held in Manchester in April 2003.

I hope you enjoy the collection of articles feature in this edition of the journal. The editorial board looks forward to publishing more exciting work from colleagues, researchers and students.

Adjustment in adults with alcoholic parents: The role of negative childhood experience and maternal alcoholism

Francis McGuire, Brain Injury Rehabilitation Centre, Rathbone Hospital, Liverpool

Andrew Guppy, Professor of Applied Psychology, PhD, MSc, BSc, School of Health and Social Sciences, Middlesex University

Abstract

Objectives: To examine negative childhood experiences (NCE) and adjustment measures within a sample of adults reporting to be children of alcoholic parents (ACOAs) and adults with non-alcoholic parents (non-ACOAs).

Design: A cross-sectional self-completion survey was undertaken within a non-clinical, non-college sample.

Methods: Sixty-seven ACOAs and 70 non-ACOAs completed questionnaires containing an NCE scale and the measures of adjustment including coping, affect, mastery and fear of negative evaluation.

Results: It was found that NCE scores were significantly correlated with all the measures of adjustment. ACOAs showed significantly more negative childhood experiences, lower perceived mastery, affect and active coping and greater fear of negative evaluation and more frequent use of avoidance coping. Further analyses found that ACOAs whose mother had been the alcoholic parent showed significantly more negative childhood experiences, less active coping, lower mastery and greater fear of negative evaluation.

Conclusions: The results indicate the importance of negative childhood experiences in the development of poor adjustment in ACOAs. Such negative adjustment seems magnified in cases of maternal alcoholism.

Keywords

Adult Adjustment; Negative Childhood Experience; Parental Alcoholism.

Introduction

In early work in this field, Cork (1969) found that most alcoholic families lacked solidarity and existed in a state of constant turmoil, sibling relationships were characterised by dissension and separation culminating in considerable tension, quarrelling and fighting which mirrored parental behaviour. Furthermore, Black (1981) found that adult children of alcoholics (ACOAs) displayed problems with alcohol and substance abuse and had low self esteem and an inability to trust. Other researchers have found ACOAs to show difficulties in developing interpersonal relationships, maintaining these over time and developing positive self perceptions (Sher, 1991). Bradley & Schneider (1990) reported that ACOAs had a higher need for control, whilst Berkowitz and Perkins (1988) found ACOA's more likely to report greater levels of self-deprecation.

In a study of 170 ACOAs without personal drinking problems, Velleman & Orford (1990) found they almost exclusively reported childhood experiences as highly negative. There were massive differences between ACOAs and a comparison group on virtually all of the childhood measures. Yet Velleman & Orford (1993) found when the same groups were questioned about their current (adult) lives there were almost no differences. A small minority did seem to be damaged by their experience, it was found that drinking in the home, or having two parents with a drinking problem were contributing factors to this outcome. However, the research found that the most important factor in negative outcomes was not problem drinking per se, but family disharmony. Velleman & Orford propose what they perceive to be protective factors responsible for the mediation of adult adjustment problems. These include the reaction of the non-alcoholic parent, their ability to maintain a stable environment, the maintenance of a cohesive parental relationship and a cohesive family. However, the sampling utilised a great deal of subjects recruited through public advertising. The salience of the adult child issue may have affected the findings in two ways. It may have led to the recruitment of subjects to some degree comfortable enough with the issue to reply, and further, knowledge of the purpose of the search could leave it vulnerable to response bias.

Secondly, and vitally important to the present study, the childhood experiences of respondents were measured on the N.C.E scale, a 12 item checklist, which addressed issues of family cohesiveness, finances and social isolation. This scale though in checklist form is inadequate in measuring the severity of the experience; exposure to an event once cannot be viewed as comparable to experiencing it every weekend. The failure to include the severity of exposure to alcoholism as a variable in research design is apparent in virtually all studies of ACOAs, the present study will address this.

There is a considerable amount of support for the findings of Velleman & Orford (1993), evidence which opposes what Wright & Heppner (1993) have termed the uniformity myth, that ACOAs are a uniform group, who all have predictable psychological problems as a direct result of familial alcoholism. Wright & Heppner (1993) found that ACOAs and non-ACOAs showed no difference on a number of variables, social support, interpersonal cognitive schema and problem solving. It does seem somewhat ironic however that in debunking the uniformity myth the emphasis has been on sampling non clinical ACOAs as opposed to clinical ACOAs whilst ignoring important within group differences. Such an approach leads only to a dichotomy between clinical and non-clinical ACOAs, this is neither enlightening or theoretically useful. This neglect of within ACOA difference is it may be argued an important methodological weakness, another is the use of college samples, unrepresentative in general this confound is greatly magnified when it is considered that low academic achievement is amongst the highest correlates of familial alcoholism (Sher, 1991). An obviously important yet ignored within ACOA variable is the gender of the alcoholic parent. When it is considered that a major factor in poor adult outcome is exposure to drinking in the home (Velleman 1993) and that more women tend to drink at home (Wilson, 1980), its relevance is apparent.

Another factor influencing many findings in this field is the issue of unmeasured comorbidity. The seriousness of such a potential confound is clear when the high prevalence of comorbidity among alcoholics is considered. For example Hesselbrock et al (1985) found that 77% of hospitalised alcoholics were diagnosed with an additional psychiatric disorder (e.g. depression, anxiety, antisocial personality disorder). Failure to control for this is apparent in the vast majority of previous research. In a similar way previous studies, whilst claiming a non-clinical sample did not reflect in

their design screening to ensure this. It is quite possible that despite not being sampled from a clinical setting, a subject may have received previous counselling, therapy, or be part of a self help group. Both these factors will be reflected in the design of the present research.

Other research has found differences between ACOA groups in psychological well-being and associated factors. Bradley & Schneider (1990) and Hall et al (1994) report differences between ACOAs and non-ACOAs on locus of control scores. Hall et al (1994) also found ACOAs to display greater levels of social anxiety than non-ACOAs, these issues will have an effect on an individuals functioning and are worthy of investigation. The research also proposes to examine levels of coping skills, an important feature of successful adjustment amongst, ACOAs and non-ACOAs as well as considering the current affective state.

Hypotheses

Specifically, the research will examine the following hypotheses:
1) There will be a significant relationship between negative childhood experience and adult adjustment measures;
2) There will be an effect of parental alcoholism on levels of negative childhood experience and adult adjustment measures;
3) There will be an effect of gender of alcoholic parent on N.C.E. scores and measures of adult adjustment;
4) There will be an effect of gender of ACOA on measures of adult adjustment;
5) There will be an interaction between the gender of the participant and the gender of the alcoholic parent in relations to adjustment scores;

Method

Design

Various methods of collecting data were considered, the use of individual interviews was rejected for two reasons. Such an approach was deemed to be overly time consuming and also because of the sensitive nature of the material a priority was considered to be furnishing the respondent with the greatest degree of confidentiality possible. The use of a self-completion questionnaire successfully addressed both these problems, importantly subjects could respond in complete anonymity as a stamped addressed envelope was provided.

Questionnaire Design

The questionnaire was designed to address a number of previous methodological weaknesses. All measures on the questionnaire were non specific to parental alcoholism, therefore participants were blind as to the particular focus of the study although aware of the aim of examining the relationship between childhood experience and adult adjustment. This reduced the possibility of response bias due to the salience of the adult child issue with ACOA status based on self report of an alcoholic parent, this produced independent variables of ACOA and non-ACOA.

The final section of the questionnaire was structured to control for a number of possible confounds. Firstly respondents were asked to indicate any parental psychopathology among the following range, schizophrenia, manic depression, depression, alcoholism, drug addiction and anxiety disorder. In this manner parental alcoholism with and without comorbid psychopathology, and psychopathology of non alcoholic parents could be established. Secondly respondents were asked to clarify whether this parent was a regular member of the family unit. Thirdly to ensure a non-clinical sample participants were requested to report any counselling or therapy they had received due to this. As the research was also interested in within group differences among ACOAs, provision was made for the reporting of gender of respondent and gender of parent reported as pathological thus providing a range of independent variables for within ACOA analysis.

Measures

Negative childhood experience scale (NCE): The NCE (Velleman & Orford 1990) is a 12 item questionnaire taken from a larger pool of items generated from previous literature and preliminary work. In its original form the scale was a checklist with respondents answering yes or no, the internal consistency in this format was good (α=.78). The present study in attempting to gauge the severity of experience over time has altered the N.C.E to a fully anchored relative frequency response format, each item scoring from 0 - 4 ('never' to 'very often'). This adjusted format for the NCE scale obtained a high internal consistency estimate (α=.95) within the present sample.

Fear of negative evaluation scale: (FNE) The FNE brief scale (Leary 1983) is a revised version of the F.N.E (Watson & Friend 1969). The 12 item scale is designed to test apprehension about others' evaluations and achieved a high internal consistency within this sample (α=.94).

Affect balance: The Affect Balance Scale (Bradburn, 1969) scores an individuals position on two different dimensions, one positive, one negative. The 10 items are asked as a series of yes/no questions about feelings during the past few weeks. One point is given for each positive response to a positive item, and one point for each positive response to a negative item. Affect balance is computed as positive affect minus negative affect plus a constant of 5 to avoid negative values. Scores range from 0 (lowest affect balance) to 10 (highest affect balance). Reliability for this measure was estimated as α= .74 when the negative items were reverse scored.

Mastery scale: Three items from the Mastery scale (Pearlin and Schooler, 1978) were used to measure an individuals level of perceived control over their life. Respondents are asked to indicate to what extent they agree with each item on a Likert scale ('strongly agree' to 'strongly disagree'). Possible scores range from 3 to 12. This measure provided an internal consistency estimate of α=.80 in the present sample.

Reported frequency of Coping Behaviours: This scale consisted of twelve items, 10 items were taken from the Cybernetic Coping Scale (Edwards & Baglioni 1993) with two further questions reflecting social support seeking from the Ways of Coping Checklist (Lazarus & Folkman 1984). Each item was scored on a scale of 1 (never) to 5 (always). For the purposes of the present study the responses to the coping items were subjected to Principal Components Analysis, producing two orthogonal factors, with the factor scores saved using the regression-based procedure within SPSS (thus maintaining orthogonality of the factor scores). The first factor reflected coping dimensions of problem-focused coping, social support seeking, accommodation and tension reduction coping and was labelled 'active coping'. The second factor represented the coping dimensions of avoidance and devaluation coping and was labelled 'avoidance coping'.

Sampling and Procedure

An opportunity sample was used from a variety of sources. Local employers were contacted and a request was made for permission to ask employees to take part. Further respondents were recruited through local churches and clubs, with a number finally being gathered from public places (cafe's, shopping centres, etc). The only requirement for selection was for respondents to be 16 or over. Possible participants were approached and asked if they would take part in a survey investigating the relationship between childhood experience and later adult adjustment. Two hundred and fifty

participants agreed to complete the questionnaire. These were then returned using pre-paid, addressed envelopes or through internal mailing systems.

Results

Completed questionnaires were returned by 137 of the 250 potential participants, with a further 17 returning blank or incomplete questionnaires. Thus the initial sample comprised 67 ACOAs and 70 non-ACOAs. Prior to the analysis a number of cases were rejected as a result of the screening criteria. Twelve ACOAs reported co-morbid parental psychopathology, whilst 7 non-ACOAs reported a parental psychopathology. A further 4 ACOAs and 2 non-ACOAs reported having received counselling or therapy. These respondents were eliminated from analysis. This produced a final sample of 51 ACOAs and 61 non-ACOAs. The mean age of this sample was 32.94 years (SD = 12.56) with ages ranging between 16 and 67.

Negative Childhood Experiences and Adult Adjustment

The first hypothesis investigated the relationship between negative childhood experience (NCESCORE) and 4 measures of adult adjustment, fear of negative evaluation (FEARNEG), mastery, active and avoidance coping and affect. The resulting correlations are shown in Table 1. As can be seen from this table, there were strong significant associations (all p <.001) between negative childhood experience and the adult adjustment measures of affect, mastery, fear of negative evaluation and both coping measures. Higher scores on the negative childhood experience

scale were significantly associated with lower perceived mastery, lower positive affect, higher fear of negative evaluation, lower active coping and more frequent avoidance coping.

Parental Alcoholism, Negative Childhood Experiences and Adult Adjustment

The second experimental hypothesis investigated the effect of parental alcoholism on the severity of negative childhood experience and on adult adjustment, using a sample of 51 ACOAs and a group of 61 non-ACOAs (see Table 2 for means, standard deviations and t values). As can be seen from Table 2, there were significant differences between the two adult groups across all of the measures reported. Thus it would appear from the results that there is a significant increase in negative childhood experience reported by the adult children of alcoholic parents. This group also reported significantly less perceived mastery, lower affect and active coping as well as greater fear of negative evaluation and more avoidance coping.

Gender of Subject and Parent and Adult Adjustment

The final set of hypotheses concerning differences within the ACOA group were: a) there will be an effect of gender of alcoholic parent on NCE scores and measures of adult adjustment b) there will be an effect of gender of ACOA on measures of adult adjustment c) there will be an interaction effect between gender of alcoholic parent and gender of ACOA on measures of adult adjustment.

Table 1.
Intercorrelations among childhood experiences scale and adult adjustment measures (all significant at p<.001, N=112).

	NCESCORE	AFFECT	ACTIVE COPING	AVOIDANCE COPING	FEARNEG
AFFECT	-.589				
ACTIVE COPING	-.385	.404			
AVOIDANCE COPING	.521	-.369	.000		
FEARNEG	.745	-.503	-.349	.472	
MASTERY	-.722	.426	.469	-.411	-.652

Table 2: Group means for NCE and adjustment measures and t test results

GROUP	NCESCORE	AFFECT	ACTIVE COPING	AVOIDANCE COPING	FEARNEG	MASTERY	N
ACOA							
Mean	29.804	4.569	-.238	.457	41.216	7.118	51
SD	13.778	2.532	1.139	.981	12.919	2.295	
non-ACOA							
Mean	10.344	6.705	.199	-.382	27.459	9.426	61
SD	6.950	2.348	.825	.850	10.282	1.698	
t-values	9.16	-4.63	-2.28	4.85	6.13	-7.12	
p (t)	<.001	<.001	.025	<.001	<.001	.001	

Gender of Subject and Parent and Adult Adjustment

The final set of hypotheses concerning differences within the ACOA group were: a) there will be an effect of gender of alcoholic parent on NCE scores and measures of adult adjustment b) there will be an effect of gender of ACOA on measures of adult adjustment c) there will be an interaction effect between gender of alcoholic parent and gender of ACOA on measures of adult adjustment.

Table 3: Summary of 2x2 ANOVAs on Participant Gender and Gender of Alcoholic Parent across adult adjustment measures and Negative Childhood Experiences

	Group Means Female participant		Group Means Male participant		Effects	Mean Squares	F value df 1,47
	Mother n=12	Father n=13	Mother n=13	Father n=13			
NCE	33.58	22.08	35.15	28.69	Subject	218.83	1.26
					Parent	1035.89	5.97*
					SxParent	81.03	0.47
Active Coping	-.80	.59	-.62	-.17	Subject	1.28	1.19
					Parent	10.49	9.80**
					SxParent	2.79	2.61
Avoidance Coping	.66	.28	.35	.54	Subject	.004	.00
					parent	.106	.11
					SxParent	1.026	1.03
Mastery	6.33	8.54	6.00	7.54	Subject	5.78	1.29
					Parent	44.97	10.01**
					SxParent	1.42	0.32
Affect	4.42	5.08	3.69	5.08	Subject	1.60	0.25
					Parent	13.70	2.12
					SxParent	1.67	0.26
Fear of Negative Evaluation	44.58	34.54	48.62	37.38	Subject	149.62	1.05
					Parent	1464.23	10.23**
					SxParent	4.48	0.31

A series of 2 x 2 ANOVAs were performed on the adjustment scores with groups defined by participant gender (male n=26 and female n= 25) and alcoholic parental gender (male n=26 and female n=25). Significant main effects were found for the gender of alcoholic parent on NCE score, fear of negative evaluation, active coping and mastery (see Table 3). No significant effects were found for avoidance coping or affect. Thus maternal alcoholism was significantly associated with greater negative childhood experiences, less frequent active coping, lower perceived mastery and greater fear of negative evaluation. No other significant main or interaction effects were observed. Thus the hypothesis that there will be an effect of gender of alcoholic parent on NCE score and measures of adult adjustment is accepted. However, the hypothesis that participant gender would affect the adult adjustment measures was rejected as was the hypothesis that there would be an interaction between participant gender and gender of alcoholic parent.

Discussion

From the perspective of the relationship between negative childhood experiences and adult adjustment, the current results show strong associations across the range of measures used. Negative childhood experiences relate to less active coping, more frequent avoidance coping, lower affective well-being, lower levels of perceived mastery and higher levels of fear of negative evaluation. To some extent such findings linking parental relationship problems in childhood and adolescence to adult well-being support the results concerning 'demoralisation' reported by Velleman and Orford (1993) as well as supporting findings in the general well-being literature (e.g. Firth-Cozens, 1992).

Perhaps a more important finding of the present research is the existence of significant differences between ACOAs and non-ACOAs on both severity of negative childhood experiences and levels of adult adjustment. Contrary to previous research (Velleman & Orford 1993, Mothersead et al 1998), ACOAs showed impoverished functioning in comparison with non-ACOAs on the adult adjustment measures of mastery, affect, active and avoidance coping, and fear of negative evaluation. ACOAs reported lower levels of perceived mastery, lower levels of active coping and more frequent avoidance coping. Additionally, their level of affect balance over the two weeks preceding the research was found to be more negative than non-ACOAs and they expressed greater fear of negative evaluation. The present research concurred with

the findings of Velleman & Orford (1993) in finding that ACOAs reported greater levels of negative childhood experiences than non-ACOAs. This then begs the question why the difference in outcomes? Velleman (1993) proposed that discontinuity between childhood problems of children of alcoholics and later adult adjustment could be explained by the existence of protective factors such as a cohesive family, a cohesive parental relationship, the role the non-alcoholic parent plays and the influence of other important figures such as grandparents and teachers. However such an explanation becomes problematic as questions on the NCE scale directly reflect the prevalence of such protective factors. This, therefore, provides a strong case for arguing that the greater the level of negative experience a child is exposed to must reflect (by definition) a poverty of protective factors in family dynamics. As Velleman & Orford's (1993) sample reported high levels of NCE, there would seem to be other factors contributing to the failure to find differences between ACOAs and non-ACOAs. The adjustment of the response format for the NCE scale in the present study allowed for the severity of childhood experience to be accounted for giving greater scope for discrepancy between ACOAs and non-ACOAs. Further by controlling for comorbid psychopathology of alcoholic parent and importantly for psychopathology of non-alcoholic parents a number of potential confounds were removed. In the latter case this ensured that differences between the groups were not obscured by the impact of say for example growing up with a depressive or a schizophrenic parent.

The present findings do offer some support for Black et al (1986) who argue that the impact of childhood experience of parental alcoholism may be enduring. Alternatively, it is plausible that the negative adjustment observed was the result of recent events, and here what may be apparent is the influence across other areas of maladjustment. The affect balance scale is a measure of subjective well being, which will be affected by continually being afraid of the negative evaluation of others, by having poor coping strategies or feeling powerless to implement changes in life. Trouble in forming and maintaining relationships, in developing intimacy (Woititz 1983, Black et al 1986) in trusting others (Hall et al 1994) have all been claimed to be characteristic of ACOAs. It seems plausible to suggest that the greater fear of negative evaluation among ACOAs in the present study is at least analogous to these difficulties, and may in fact offer some form of explanation for them. This again seems reasonable when considering Woititz (1983) observation that ACOAs constantly seek approval, this could be interpreted as a way of

removing or reducing this fear. Control over one's life has often been quoted as being a major issue for ACOAs. Hall et al (1994) found that ACOAs to have greater internality on locus of control. This was interpreted as reflecting the ACOAs greater need for control over their life. However it may be argued that desire for something may not in itself be enough to produce it. The present research found that ACOAs had significantly lower levels of perceived mastery over their life than non-ACOAs.

The development of adequate coping strategies among ACOAs has long been the subject of conjecture although little empirical research has been carried out. The present research found ACOAs to have lower reported frequency of active coping and higher reported frequency of avoidance coping than non-ACOAs. Much research has linked excessive alcohol and avoidance coping strategies (e.g. Evans and Dunn, 1995), therefore in a home where alcoholism has become a major focus the scope for learning and adopting successful strategies from parents may be severely limited.

Thus the results show strong significant associations between negative childhood experiences and the measure of adult adjustment as well as showing ACOAs to differ significantly from non-ACOAs on all adult adjustment measures considered. The ACOAs also had higher negative childhood experiences, when this is considered alongside the result of the aforementioned correlations, there is a strong suggestion that it is the level of negative childhood experiences rather than parental alcoholism per se that is pertinent to later adult adjustment. The ability to make such a distinction becomes important when considered in light of implications for intervention.

Participant and Parental Gender

The findings supported the third experimental hypothesis that there would be an effect of gender of alcoholic parent on measures of adult adjustment. ACOAs whose mother was alcoholic showed poorer outcome on a number of measures. Such respondents had a greater fear of negative evaluation and lower perceived mastery than those with alcoholic fathers. Importantly maternal alcoholism also produced greater level of negative childhood experiences than paternal alcoholism further supporting the suggestion of it's importance in the development of adjustment problems. These differences occur despite the gender of the child. Questions then arise as to what factors play a part in these differing outcomes. Bewley et al (1979) argue that alcoholism is not a unitary process with a single causation but a disorder with a mass of varied origins. The process

of an alcoholic career may encounter and encompass many different pressures which can shape resultant drinking behaviour. Velleman (1993) points out that women alcoholics drink more in the home than their male counterparts. Further he suggests that exposure to drinking in the home is a major predictor of poor outcome for children of alcoholics. Culturally male drinking is for the most part carried out in pubs and social clubs, although still the cause of much disharmony in the family, the children are spared the sight of their parent actually getting drunk, this is not the case when drinking is done at home. This exposure may increase the severity of experience a child encounters.

The research found no support for the fourth hypothesis, that there would be an effect of gender of ACOA on adult adjustment measures. The findings suggested that whether the child was male or female was insignificant. This may be taken to offer further support of the important influence of the quality of childhood environment provided by the parent. It would be improbable to expect children of a specific gender to have the ability to alter this environment, therefore had any effect been found it would have suggested the operation of another variable on the outcomes of adult adjustment. This to some extent is further supported by the lack of any interaction effect between gender of child and gender of alcoholic parent.

Implications of the Research

The findings of this research suggest strongly that children who grow up in a home where a parent is alcoholic are at greater risk of developing adjustment problems in adult life, and that these outcomes are strongly linked to the level of negative experiences a child encounters. This has important implications for intervention Firstly these results seriously challenge the view now in vogue amongst researchers in this area, that children of alcoholics are not liable to develop long term problems. Rather than closing the book on the idea that ACOAs and non-ACOAs differ in levels of adjustment, it is perhaps time to err on the side of caution and accept that children of alcoholics are a high risk group for both short and long term effects. Due to this risk it is appropriate for this group to be a target of intervention. The present research has highlighted the influence of negative childhood experiences on later adult adjustment, it is logical then to expect that intervention will be more successful if it occurs during childhood. Furthermore, agencies involved in intervention should be patently aware of the increased risk, when the alcoholic is the mother. The nature of

maternal alcoholism seems to produce a greater deal of negative events for children of alcoholics and may require even more strenuous efforts to aid the production of a better quality of family environment.

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Active and passive spatial learning from a desk-top virtual environment in male and female participants: A comparison with guessing controls

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Abstract

Undergraduate students were asked to explore a single room virtual environment (VE) containing 6 objects at floor level, depicted on a desk-top monitor. Exploration was either active (using keyboard keys to control displacements) or passive (observing an active participant), with male-male or female-female active-passive pairings. Following exploration, all participants were asked to independently complete a map task, requiring them to indicate the positions of 5 of the floor objects using a map which showed the one remaining (reference) object. Guessing controls performed the same task but without experience of the room or VE. No gender differences were obtained. Both active and passive exploration groups were more accurate than guessing controls, and no significant difference was obtained between the two exploration groups. The results are in agreement with several previous studies, which found no active-passive differences in VEs. This finding contrasts with real world exploration, where active-passive differences are invariably found. This difference might be explained if VE learning is more explicit than real-world learning, or if a VE imposes greater working memory load.

Keywords

Virtual environment, exploration, activity-passivity, undergraduates

Introduction

It has long been known that the formation of spatial representations is facilitated by active experience within an environment (Piaget, 1968; Piaget and Inhelder, 1967). Downs and Stea (1973) have proposed that spatial representations are primarily the result of inter-sensory connections between the visual, motor and kinaesthetic sensory modalities, whilst Lee (1968) argued that practical activity causes spatial representations to evolve and crystallise.

Urban studies of the early 1970s have also yielded findings to support the proposition that activity within an environment leads to the formation of better mental maps of that environment. For instance, Appleyard (1970) had inhabitants of a Venezuelan city draw maps of the whole city and of their local areas in order to study their mental maps of the city. He found that the quality and completeness of the spatial representations depicted in the maps was a function not only of length of residence but also dependent on whether or not the respondent was a car driver or bus passenger. People, who had been residents for longer and those who drove, drew more spatially representative maps than newcomers or bus passengers. Hart and Berzok (1982) point out that car drivers invariably acquire more spatial knowledge than their passengers. Ladd (1970) found that maps drawn by black urban adolescents increased in quality and richness of detail as functional activity within their environment increased.

More recently the benefits of activity for the formation of spatial representations has been repeatedly demonstrated using smaller scale environments (Feldman and Acredolo, 1979; Herman, 1980; Herman, Kolker and Shaw, 1982; Foreman, Foreman, Cummings and Owen, 1990; Foreman, Gillett and Jones, 1994; McComas, Dulberg and Latter, 1997). For example McComas et al (1997) found that 6-7 year olds, who had moved actively during training trials to find target objects hidden in a large room, were significantly more accurate at relocating them during testing than were children who had been passively pushed in a wheel chair. Foreman et al (1990) found that children given active choice, whether or not they were motorically active, performed better on a radial search task than did either purely passive or motorically active but choice-passive children. Both cognitive (Garling, Selart and Book, 1997) and physiological (O'Keefe and Nadel, 1978) models of spatial cognition have emphasised the role of activity and the continuous feedback that occurs contingent upon self-initiated movement, in establishing cognitive spatial maps of environments.

Virtual environments (VEs) are computer models that may be experienced and manipulated interactively (Barfield and Furness, 1995; Rose and Foreman, 1999), and have been shown to be a good medium for the acquisition and transfer of spatial information in adults and children (Stanton, Wilson and Foreman, 1996; Wilson, Foreman and Tlauka, 1996; Ruddle, Payne and Jones, 1997; McComas, Pivik and LaFlamme 1998; Peruch and Gaunet 1998; Foreman et al, in press). For instance Wilson et al (1996) found that participants who explored a to-scale VE of a multi-story building performed at an equivalent level to participants who had explored the real building on a pointing-to-unseen locations task, whilst McComas et al (1998) found no advantage for children trained in real space over those trained in VR on a location of hidden objects task.

However, despite the large amount of evidence indicating the equivalence of spatial learning in real and virtual worlds, studies using VR environments have failed to indicate any beneficial effect of activity over passive observation (Peruch and Gaunet, 1998; Wilson, 1999; see Foreman and Sandamas, 2002 and Wilson, 1997 for reviews), particularly in terms of virtual object location (Brooks, Attree, Rose, Clifford and Leadbetter, 1999). For example, Wilson (1999) and Wilson, Foreman, Gillett and Stanton (1997) were able to find no evidence to suggest that psychologically active or motorically active participants gained any advantage in a pointing to unseen object task over their passive-observer counterparts. Similarly, Gaunet, Vidal, Kemeny and Berthoz (2001) reported that they could find no difference between participants who had actively explored a virtual town by control of an input device and passive participants who viewed a route imposed by the computer on subsequent tests of spatial memory. Rossano, West, Robertson, Wayne and Chase (1999) used passive exploration in a VE, apparently unwittingly, but appeared to obtain good spatial learning. Further examination of this issue is important because it relates to the potential of virtual environments as spatial training media.

Gender differences in spatial performance are frequently reported, favouring males (Linn & Petersen, 1985; Voyer, Voyer and Bryden, 1995), and although these are most often observed in relation to mental rotation (Geary, Gilger and Elliot-Miller, 1992) gender differences may also exist in larger-scale navigational abilities. Males have been reported to attend primarily to cardinal and distance attributes, while females attend more to landmarks when navigating or using maps (Choi and Silverman, 1996; Eals and Silverman, 1994).

Moffat, Hampson and Hatzipantelis (1998) found that males showed superior maze learning in a VE, and indeed, Astur, Ortiz and Sutherland (1999) have suggested that gender differences are especially likely to appear in virtual spatial tasks in which a simulation of an arena is navigated and remembered. On the other hand, some studies (e.g., Waller, 2000) have shown that gender is a relatively minor factor in determining performance in such tasks, especially once the effects of computer game familiarity is factored out. To investigate possible gender differences in performance of the present task, both male and female participants were included.

In past studies, where no difference has been observed between participants who have either actively explored, or passively witnessed exploration of, a virtual environment (VE), this could be because they are equally good at remembering the spatial layout of a VE or equally bad. The effective use of VEs in spatial training with active participants (McComas et al, 1998; Ruddle et al, 1997; Stanton et al, 1996) suggests that actives acquire high quality spatial information, and by implication, that passives are likely to do so as well. However this has not been formally investigated to date. The main purpose of the present study was therefore to assess the performance of both active and passive groups against that of a naïve control group, who could only make guesses about the spatial layout of the environment. Our hypothesis predicts that both active and passive participant groups will make more accurate judgements than the guessing control group.

Method

Participants

Participants were 24 male and 24 female undergraduate students. They were aged 17-30 years and all had normal or corrected-to-normal vision. Thirty-two participated in the study as experimental participants. These gave informed consent to participate in the study and were informed that they could withdraw from the study without penalty at any time. Their participation was rewarded with 'experimental participation' credits. The remaining 16 undertook a relatively trivial task (see Procedure) for which informed consent was considered unnecessary.

Equipment

The VE was created using Superscape VRT software, and displayed on a standard 21-inch

monitor. The environment was dimensioned in a similar fashion to previous comparable studies (McComas et al, 1998; Stanton et al, 1996), with the virtual head height set to a typical human value of 170 cm.

Procedure

Testing took place in a quiet room, illuminated by overhead strip lights and with external light excluded by blinds. Thirty-two participants were tested in pairs. The pairs were given simultaneous instructions, which differed according to the group to which they had been allocated. Students were paired in same-sex pairings but otherwise randomly. In each pair, an active participant sat at a comfortable viewing distance from a desk-top computer monitor on which was depicted a virtual environment (VE). The VE consisted of a room, which could be entered by opening a door via a mouse click. The walls were sand coloured and the floor grey, and the room had windows, doors and cabinets around the edge. Distributed within the room were 6 colourful objects (traffic cone, computer monitor, bottle, pot plant, gramophone, and road work sign), an object array which could be easily remembered. The objects were placed in a roughly circular arrangement. The active participant was asked to explore the room for up to 5 minutes (until they reported familiarity with the depicted environment; cf. Waller, 2000), using the directional keys on the computer keyboard to move themselves about in virtual space. To ensure that they had experienced all the objects in the room, they were asked to visit each of them twice in the course of exploring. A visit to an object consisted of moving toward it as though to touch it, and registering the visit via a mouse click. Objects could be visited in any order, but participants were asked to vary the order in which visits were made on each tour. Passive participants sat beside their paired active participant and observed their exploration. The pairs did not communicate with one another. At the outset, all participants were given the instruction to "remember the layout of the room", and thus the task was an explicit task, although since the participants did not know exactly what was to be examined, there was an implicit element.

Following the exploration phase, the participants were taken without delay to different parts of the room, and tested individually. They were given a plain sheet of A4 paper on which was shown a map of the room containing one of the room objects (the traffic cone). They were asked to draw 5 crosses, representing the other objects and to label them. They were not restricted in time, but all participants performed this task within 1-2 minutes.

The maps were assessed for placement accuracy by measuring the distance in cm. of the true object position (taking the centre of the object as a reference) from the centre of the corresponding marked cross drawn by the participant.

In order to compare the results with guessing controls, two further groups of participants were recruited, 8 male and 8 female, who were tested individually. They were given the room map (with only the traffic cone shown) and asked to guess where 5 objects might be placed in the room, and to indicate their guessed positions via crosses, numbered arbitrarily 1-5 (computer = 1, pot plant = 2 and so on). (In many cases, a circular arrangement of objects was anticipated by the guessing participant; objects were often placed and labelled 1-5 in a clockwise fashion, which corresponded to the labelling order of the virtual room objects. If anything, this had the effect of biasing the data in favour of the null hypothesis when comparisons are made involving the guessing control groups). The placement error scores of the guessing controls were calculated as for the experienced participants.

Results

Initially, a 1-way independent analysis of variance (ANOVA) was used to compare the placement accuracy of the three groups (active, passive and guessing) (see Figure 1). The dependent variable was the mean error placement score (measured in cm.) averaged across the 5 objects. A highly significant group effect was obtained, $F(2, 45) = 17.2$; $p < .001$. There was no significant difference between the active and passive experienced participants, $p > .2$, and indeed, the passive participants' error scores were arithmetically lower than those of active participants (Figure 1). However, there were highly significant differences between both groups of experienced participants and guessing controls, both p's $< .001$.

The placement error scores of the 32 experienced participants were then examined using a 2 (activity) x 2 (gender) x 5 (objects), 3-way mixed analysis of variance (ANOVA) with object the repeated measure. The guessing participants were excluded from this analysis, since the inclusion of guessing data would have served only to obscure differences between male and female and active and passive groups, and among objects.

The analysis confirmed the absence of any significant difference between active and passive conditions, $\underline{F}(1, 28) = 1.306$; $\underline{p} > .05$, and revealed no significant difference between gender groups, $\underline{F}(1, 28) = .064$; $\underline{p} > .05$. There was no interaction between gender and activity, $\underline{F}(1, 28) = .70$; $\underline{p} > .05$. Objects differed in the memorability of their spatial locations, $\underline{F}(4, 112) = 2.88$; $\underline{p} < .03$, the gramophone being significantly more accurately placed than the road sign, $\underline{p} < .02$, but there was no interaction between activity and object, $\underline{F}(4, 112) = 1.07$; $\underline{p} > .05$, nor between gender and object, $\underline{F}(4, 112) = .60$; $\underline{p} > .05$, and no significant 3-way interaction, $\underline{F}(4, 112) = .64$; $\underline{p} > .05$.
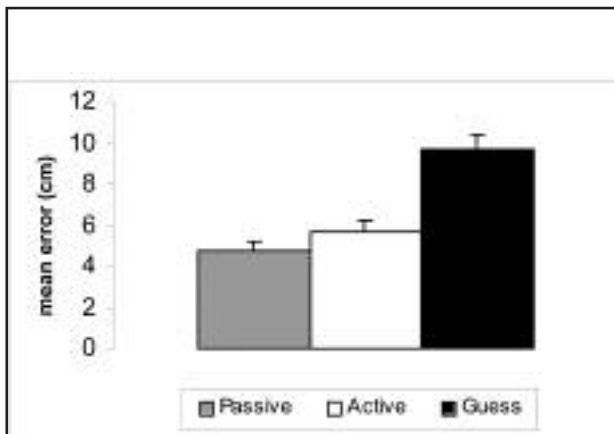
Figure 1: Mean placement errors

Figure legend

Mean placement errors (+ SE) in cm. averaged across the 5 placed objects in groups of participants who actively explored the VE (active), passively watched while an active participant explored (passive) or who guessed the object positions without VE experience (guess).

Discussion

It is clear that both active and passive exploration groups acquired a considerable amount of spatial information from their exploration of the VE, insofar as both groups were significantly more accurate in placing the room objects than the guessing control group. The absence of a significant difference between the active and passive groups implies that they achieve an equally good level of performance, and not an equally poor level. In other words, the failure to find differences between these groups is not due to a 'floor' effect. The placement errors of guessing controls were double those of experienced participants, whether the latter were actively directing and controlling their displacements or passively observing an active participant. The results of the active-passive

comparison are consistent with many previous reports, which have failed to obtain benefits of active interfacing with a VE on spatial memory for virtual object locations (Gaunet et al, 2001; Peruch & Gaunet, 1998; Wilson, 1999; Wilson et al, 1997).

The reasons for the lack of significant effects between active and passive participants may relate to the style of presentation, since the televisual medium is one through which we frequently obtain information of a spatial nature and it is possible that humans are adept at acquiring spatial information while passively observing 2-D screen depictions. Against this view is that in one study in which activity in a VE was found to enhance spatial memory, Peruch, Vercher and Gauthier (1995) had passive watch a screen on which route displacements were shown, though it is perhaps significant that in that case, the observers were alone and not shadowing an active explorer per se. It is also possible that routes (Peruch et al, 1995) and gross configurations (Brooks et al, 1999) can be more effectively learned by active explorers of VEs than the positions of objects in virtual space.

Alternatively, and perhaps more likely, the medium in which VR is presented may confer a disadvantage on the active participant. The movements that the active participant needs to make in order to displace themselves in virtual space are themselves spatial in nature (depressing particular keyboard keys or moving a joystick) and may compete for cognitive capacity. In particular, spatial working memory functions (Baddeley and Lieberman, 1980) can be particularly influenced by interference such as tapping in spatial sequences. A further factor is the incidental versus explicit nature of the task (cf. Attree, Brooks, Rose, Andrews, Leadbetter and Clifford, 1996), since it is arguably more likely that participants in VE studies will be explicitly aware of the nature of the knowledge that they are expected to acquire. Studies are currently underway which examine these possibilities, by manipulating instructions to participants and loading the spatial working memory of passive participants.

The absence of gender differences in performance in the current study argues against the assertion by Astur et al (1999), that VE tasks are especially effective in demonstrating gender effects in spatial cognition. Indeed, where males have been found to outperform females, the effect is typically small, and mainly attributable to differential familiarity with computers and computer games (Waller, 2000). Nevertheless, the nature and scale of the task might also be significant, since Eals and Silverman (1996) have argued that while males outperform females on larger-scale tasks, the

reverse may be true for tasks involving landmark use in proximal space. Further studies, with larger participant groups, are required to examine these possibilities.

Acknowledgements

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Methodologies in practice based projects as used by Work Based Learning students in the former School of Health, Biological and Environmental Sciences

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Abstract

This article reviews the variety of applications and methodologies used in Work Based Learning (WBL) Project modules in the former School. The notion of a Work Based Learning continuum ranging from 'prescribed' to 'negotiated' learning is proposed and applied to the variety of contexts in which Work Based Learning projects have been used. The 'prescribed' learning tends to be a structured approach, using local and national documentation and information to support practice developments, whereas mixed methodologies are common in the 'negotiated' programmes, with an emphasis on qualitative data, case study and evaluation approaches. The ethical considerations that affect the choice of methodology and subject focus of the projects are explored. Positive aspects of negotiated Work Based Learning projects include the androgogical learning style which utilises their personal experiences and motivation for learning from the outset of the programme.

Key words

Work Based Learning Continuum, Work Based projects.

Introduction

Learning through work has long been a central tenet in the training and education of health care professionals, particularly nurses, and so transference of the principles of Work Based Learning (WBL) to the Health Campus has built effectively on previous structures. As the structure of WBL programmes have become increasingly embedded into the health curriculum at Middlesex University, the use of the Research and Development toolkit and application to project work has had increasing appeal to both academics and practitioners alike. This paper will review the variety of forms project work has taken and will consider the professional and organisational factors that have influenced the use of projects. It will consider the restraints that the Health environment inevitably imposes upon practitioners in terms of ethical access to patients and the need for effective mentoring of staff. The use and application of project work within the health field will inevitably influence the choice of methodologies and research tools and these influences will be outlined.

It should be clarified from the outset that the term experiential or work based learning is different to the traditional apprenticeship learning as used in past nurse training, which would have been termed 'clinical placement'. Currently, practitioners often confuse the term Work Based Learning with the opportunity to have teaching delivered in the work place rather than teaching that occurs in the academic environment. The type of WBL projects that this discussion focuses upon, are those which aim to capture the learning opportunities within health care practice, rather than the delivery of taught subject matter. The WBL curriculum structure in the School is initially used to provide a mode of accreditation of prior experiential learning. Once a baseline of knowledge has been identified through this process, the student can progress onto negotiated short, 20 credit projects, or longer 40 or 60 credit projects as a means of accruing credit towards an overall award. These projects may be supplemented by formal taught modules in order to reach an academic award, but pure WBL programmes include the student negotiating and designing the content of their curriculum, as determined by their learning needs and the demands of the workplace. The content of the curriculum may also be influenced by the employer in some cases, as they may require their employees - our students - to demonstrate knowledge and competence in particular contexts and skills.

Work Based Learning Continuum

The use of WBL projects presents a continuum within which experiential learning is facilitated. The WBL continuum starts where the learning is prescribed, and is outcomes driven, usually by the organisation, profession or curriculum. This could be likened to the National Occupational Standards (NVQs) of specific competence which provides a minimum standard and aims to provide a consistent quality service of practical competence. The WBL continuum extends towards the autonomous practitioner who develops capabilities through work as described by Stephenson (1998). This end of the continuum is characterised by individualised negotiated learning, emphasising the learning process rather than or in addition to a specific product, unlike the NVQs which focus on specific outcomes.

Prescribed Learning

To meet the needs of an organisation the use of the project module has adapted to specific requirements of the organisation. As the learning outcomes of the module can be negotiated they provide a structure which lends itself to the use of assessment portfolios and distance learning materials. This mode has been used with some success, as particular cohorts of students who need to study specific subjects as dictated by the educational curriculum or professions are able to use the focussed structure in order to study by distance learning. There is provision for access to tutorial support through a short introduction to the module whilst the students are on study day release, which is then supplemented by e-mail and phone tutorials. Completion of academic requirements is achieved by the students compiling the portfolio with evidence of their personal learning, thus demonstrating their learning progression during the time span of the module. The use of a portfolio encourages reflection upon their work situations and application of new knowledge to practice, thus aiming to close the gap between theory and practice. Subject areas that have been successfully taught by this method include 'Developing management skills in the workplace', 'Teaching and assessing in the workplace', and 'Examination of health needs of the local population'. It could be suggested that this mode of project activity fulfils both the Higher Education (HE) and organisational agendas which Garnett (2001) terms as 'transportation': a WBL method of taking the HE curriculum into the workplace.

Projects that have been prescribed by organisational demands have included a first year post registration staff nurse support programme,

and a health care support worker programme. These were designed in collaboration with practitioners who had identified a skills gap, and wanted to provide a structure for the staff undertaking the development programme, and also some academic recognition of their scholarly endeavours. These projects focus on competence in certain work-based activities and require a compilation of a portfolio, together with evidence of practice competence, and the acquisition of supporting knowledge.

This mode has been less successful, partly because the cohorts have been much smaller, but also because the need to have committed and enthusiastic mentors was not always anticipated or provided from the beginning. The concept of competency was closely linked to effective performance and achievement of results and the project content was shaped by the job role, such as can be found in NVQ competencies, rather than the individuals' abilities. This immediately raises questions regarding job security should the individual not achieve competency. Additionally, for the post registration nursing projects, the students had been studying continuously for the previous three years and needed to consolidate that study in their first professional post. Whilst they welcomed the opportunity to have support to develop clinical skills, their main priority was to become conversant with their new professional role. Having to undertake additional study and compiling a portfolio added to the pressures of balancing fulltime work and study that the students had not foreseen when commencing the course. In this instance, as the programme progressed it became apparent that the organisation had not recognised the full implications of the programme and had not provided the appropriate support for every student within the workplace. Although the organisation had taken the initiative in starting the programme, it was not fully cognisant of the internal factors that would influence the success or failure of the programme, nor had other management strategies been explored to address staff needs. Consequently appropriate support and monitoring measures for the duration of the programme had not been introduced. This emphasises that to make WBL effective there must be effective tri-partite agreement between the student, the workplace and the university for successful learning. As a result of this experience it would be appropriate to recommend that organisations who wish to enter into such a programme to meet staff development needs should also examine internal factors that may affect recruitment and retention of staff other than training. The WBL team has gained valuable learning from this experience to draw on when

supporting other organisations who have designed similar programmes accredited by Middlesex University for their staff.

The third group that uses a structured project format is the mental health rotation scheme. This scheme has been developed collaboratively with a London Mental Health Trust, and forms part of a recruitment and retention drive. By undertaking specific projects, supplemented by taught sessions, and related to mental health legislation and clinical skills, the students are enabled to complete a degree while becoming conversant with practice demands. This approach has been cited as an example of good practice in continuous professional development (CPD), and is being externally evaluated. It has had a ripple effect on the supporting workforce as it has been recognised that practice supervisors need additional skills training in clinical supervision to support this programme. This, then, is a good example of management support facilitating students' achievement, and as such is a good working example of the tripartite agreement, which Garnett (2001) terms 'Transformation', where the curriculum of the workplace is developed in partnership.

Methodologies

The methodologies used in prescribed projects tend towards the use of supporting literature; i.e. desk-work, and exploration and application of local policies and guidelines. It provides an opportunity for the students to read and become conversant with documentation that is usually only referred to in times of necessity, rather than being used as the essential documents supporting practice as they should be. As such there is a qualitative bias towards gathering and analysing data. Learning through reflection on experience and the development of a critical approach to practice is encouraged, which again reflects a qualitative bias.

This prescribed project approach aims to capture serendipitous or accidental learning - that which happens by accident during the course of work. The accidental learning can, to a certain extent, be anticipated as being potentially available within the workplace, but may need to be 'uncovered' by an expert practitioner, in order for the student to be able to see it for the learning potential that it carries and engage with the experience. Spouse (2001) suggests that these kind of learning opportunities arise when previous formal learning is built upon by informal learning, which she defines as being planned or tailored to meet the individuals predetermined learning needs. She also suggests that continuous development of professional knowledge can be most effective when carried out under the guidance and support of more experienced colleagues who have taken a number of years to become expert practitioners. The prescribed approach to projects has been seen to be particularly effective when there has been supervision in practice, and formal learning to facilitate links between theory to practice.

Negotiated learning

The other end of the WBL continuum captures the expert practitioners learning. Projects undertaken by practitioners have either been part of the overall WBL degree, or individual project modules as part of a professional degree programme. These are individually negotiated as part of an overall programme, and supported by appropriate subject specialists. The negotiated projects demonstrate individual learning acquired, for example, through local service initiatives or as an individuals professional development. The project research tools may use only small amounts of quantitative

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┌─────────────────┐          ┌────────────────────────┐
│ Entry with      │          │ Review of learning and │
│ Dip HE          │ ───────▶ │ Programme Planning      │
│ 240 CATs        │          │ 20 credits @ Level 3   │
│ Points          │          └────────────────────────┘
└─────────────────┘                      │
                                         ▼
┌────────────────────┐   ┌────────────────────────┐   ┌────────────────────────┐
│ Project Planning   │   │ Negotiated/ prescribed │   │ Final negotiated project│
│ and Development     │──▶│ projects               │──▶│ 40 credits @ Level 3   │
│ module             │   │ 2 x 20 credits @ Level 3│   │ Total 120 @ Level 3    │
│ 20 credits @ Level 3│   │ or 1 x 40 credits      │   └────────────────────────┘
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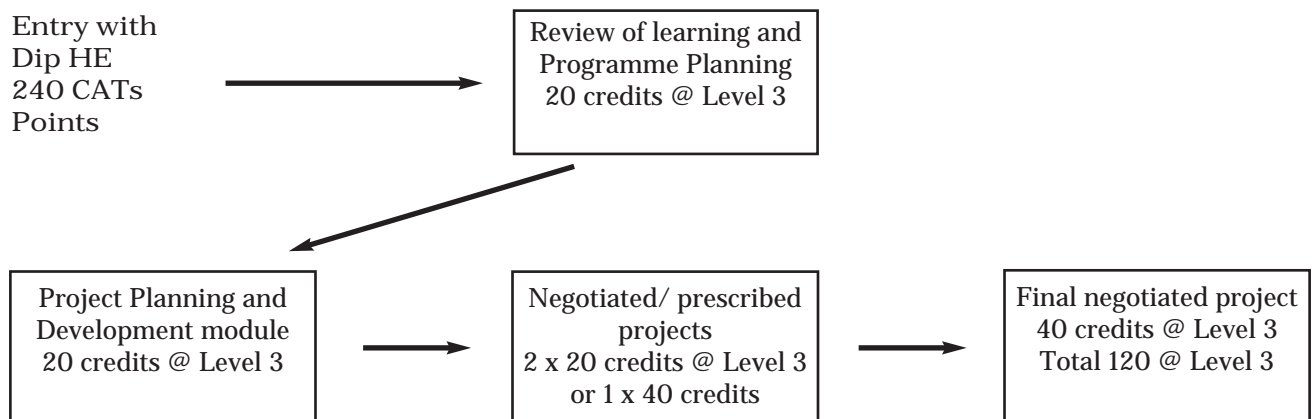
Figure 1: Typical Pathway for DipHE Nurse entrant into Work Based Learning Degree Programme

data, thereby not producing statistically significant findings, or if qualitative methods are used, there may not be findings that can be generalised. The preferred methods include case study approaches, evaluation approaches or action research methods allowing the generation of mixed qualitative and quantitative data, and using techniques such as focus groups or individual interviews, or surveys. These research tools reflect practitioner desires to explore respondents' lived experiences and to understand motivations and behaviour. However, the difficulties of working in health care emerge with these projects in terms of ethical access to patients and subjects.

Ethical issues

Research in health care has traditionally been overseen by the local health authority or acute trust ethical committees. These are in place to protect the patient and staff from unwanted or dangerous research practices, and their main activity is related to the efficacy and safety of drug trials and new clinical interventions. However, recent controversies in health care research and practices have caused committees to be particularly cautious in allowing inexperienced researchers to undertake research, even if it is not intended to be invasive. While this is laudable, it has limited many potential projects that particularly interest nurses. Additionally the time delay until the ethics committee can approve the proposal impacts on the students proposed time-scale, which is further restricted by the academic timetable, and may make the project unfeasible for the students' personal agenda.

These ethical constraints have resulted in a creative approach to project work. Audit approaches have proved useful as they allow access to quantitative data which is already available in notes, providing data protection considerations are adhered to, and uses the clinical governance agenda which requires a regular review of certain clinical outcomes and procedures (DoH 1998). Auditing current practice provides the opportunity to identify positive outcomes, and can present opportunities to recognise poor performance and gaps within the service, thus highlighting where corrective interventions can be most effective. Many health care practitioners favour the use of qualitative data, as it focuses on the lived experience of patients and staff, and illuminates the statistical information gathered from audit. The use of a qualitative approach has also proved an obstacle to local ethics committees, as it is only recently that these committees have accepted qualitative methods as a suitable research approach. This is because the professional culture has been one of scientists who have only used quantitative approaches to research

problems and whose supporting professional and academic institutions did not accept qualitative methodologies as being academically viable until very recently.

Conclusion

The positive outcomes of negotiated WBL projects reflect learning that is responsive to adult learning theory (Knowles 1983), as it is relevant to the students readiness to learn, it builds on their life and work experience and enhances it. It promotes orientation to learning by offering a problem solving approach to work, thus allowing a reconstruction of the work situation. As such it is attractive to health care practitioners due to the relevancy to their work, the potential of the dynamic response to practice demands and pragmatic application of newly acquired knowledge. The negotiated end of the continuum particularly encourages the individual to develop as an independent learner and the prescribed portfolio approach aims to develop autonomous learning, thus moving the student along the continuum. Altogether the project WBL continuum fosters internal motivation towards learning and promotes reflective characteristics.

WBL projects in the health school offer the practitioner a variety of approaches with which to explore the work place and learn through work. There are limitations in that to be successful in prescribed practice outcomes, the learner needs to be supported and mentored effectively. The negotiated projects are as flexible and as variable as the practitioners who use them, and can be an effective learning tool to explore clinical practice issues, and effect changes in practice.

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An exploration of the use of internet support groups by people with diabetes

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Abstract

People with chronic illness are being encouraged to increase their knowledge and skills in order to self-manage their condition. Living with diabetes requires an awareness of many management factors including diet, treatments and blood glucose monitoring. Internet newsgroups for people with diabetes mellitus enable people to discuss issues related to their diagnosis and treatment without meeting face to face. The authors studied the messages posted to such a group in one week in May 2002. Quantitative analysis was used to study a sample consisting of 146 messages including 70 messages from previous weeks, where previously started discussions continued in the study week. The results showed that these messages made up 32 discussions in which 61 identifiable individuals participated. Just over 60% of messages were contributed by 16 individuals, each of whom wrote 5 or more. This demonstrated an active internet newsgroup. Qualitative thematic analysis was carried out to identify five main themes: diet and exercise, insulin, complications, assessment and monitoring, oral medication. The majority of discussions, 21 out of 32, began with a question. The most frequently asked questions were about diet (7), insulin (3) and the complications of diabetes (3). The responses were compared with the advice offered in several widely available diabetes self-help books. The accuracy and practicality of the newsgroup advice compared well with the accepted understanding. The group also provided the opportunity to experience the companionship and support of peers. In collaboration with specialists in diabetes, the authors analysed the responses to more complex treatment questions and found that they generally reflected the current evidence-based knowledge. Responses were based on the participants' experience of taking the medication, but also included detailed pharmacological and clinical information. The technical skills required for the successful self-management of diabetes were frequently discussed, but the corresponding need to discuss proposed regimen changes with health professionals was also regularly advocated. The authors conclude that (with certain qualifications) this group is a valuable resource for people with diabetes.

Keywords

Internet support, newsgroups, diabetes.

Introduction

Diabetes mellitus has been defined as "a group of metabolic diseases characterised by hyperglycaemia resulting from defects in insulin secretion, insulin action or both" (Expert Committee of the American Diabetes Association 1997). It is a progressive illness that can lead to serious complications such as myocardial infarction, stroke, peripheral vascular disease, retinopathy, nephropathy and neuropathy. Diabetic retinopathy is the commonest cause of blindness in the working age population in the United Kingdom (Evans 1995). The number of people developing diabetes is rising and is thought to reach 300 million worldwide by the year 2025 (King et al 1998). In the United Kingdom, the National Service Framework for Diabetes (Department of Health 2003) offers a strategy to health care professionals in an attempt to improve the care for people with diabetes.

The impact of developing a chronic disease is said to act as a stressor and initiate coping, which can either contribute to or hinder adjustment (Michael 1996). Corbin and Strauss (1988) suggested that people have three sets of tasks: the medical management of their disease, maintaining, changing or creating new meaningful life roles, and dealing with the emotional sequeli to having a chronic condition. In diabetes, tight control of blood glucose and blood pressure improves outcomes (Diabetes Control and Complications Trial Research Group 1993, Adler et al 2000), but

comes at a cost to quality of life (Polonsky et al 1995). People with diabetes are expected to follow a healthy eating diet, maintain an ideal body mass index, exercise regularly, avoid cigarettes, adhere to a regime of prescribed medication and monitor their blood glucose levels regularly. In addition they will be advised to take extra care of their feet and may have to make special arrangements if they drive or go on holiday. Support groups and charities exist to facilitate patients' adjustment to having diabetes.

Using the internet to research the experience of chronic illness has been used to identify patients' health beliefs, common topics, motives, information and emotional needs (Eysenbach & Wyatt 2002). Researching the online questions and information posted to a diabetes newsgroup is likely to be of use to health care professionals.

Research Questions

1. How many messages were posted to the diabetes support newsgroup in one week?
2. What was the breakdown of posts according to individual contributor?
3. What were the most commonly discussed topics?
4. How did the offered information and advice relating to diabetes compare to the generally available knowledge?

Conceptual framework

The rise in diabetes mellitus and other illnesses has resulted in changing approaches to chronic disease management. The Government is currently encouraging self-management programmes for people living with chronic illness by training "Expert Patients" (Department of Health 2001). It is hypothesied that these programmes will reduce the severity of symptoms, improve confidence, resourcefulness and self-efficacy to empower people to become key decision-makers in their own care. This concept is not new. Creer et al (1976) documented the concept of self-management of chronic disease, studying patients with asthma. Self-management meant dealing with the day to day management of their condition, but seeing the health care professional for treatment, resources and if symptoms change (Lorig 2001). For people with diabetes, knowledge was found to be important in developing the confidence to become active in self-management (Brown 1992). Studying internet newsgroups provide an opportunity to read about the exchange of knowledge and development of expertise that happens without intervention from health care professionals. Many of the participants' communications demonstrate

expertise in chronic disease self-management. They discuss self-management activities such as blood glucose monitoring, changing insulin regimens and foot care. Their expertise does not appear to come from being on Expert Patient Programmes, but more from personal motivation. This corresponds with Creer's concept (1976) that many patients will somehow become expert in self-managing their chronic disease, without necessarily having attended an expert patient programme. The conceptual framework of chronic disease self-management underpins this research.

Review of literature

A review of the literature was performed using MEDLINE, CINAHL and PsychLIT electronic databases using the keywords: "internet support", "internet newsgroups", "diabetes". There were numerous studies evaluating the quality of medical information on the internet, but there very few studies evaluating the content of patient-centred newsgroups.

One study looked at the social support and advice given within Usenet groups for people with diabetes (Loader et al 2002). Although it focussed on analysing the types of supporting interventions, it also considered the accuracy of participants' knowledge of diabetes. This "lay-health" knowledge was compared to the biomedical opinions of a panel of consultant diabetologists. The researchers concluded that although some of the posts were providing inaccurate medical information, they did have a beneficial social support effect for members of the Usenet group. It was not explicit how informed consent was gained from the participants whose quotes were used.

In the United States, Barrera et al (2002) also explored online social support for people with diabetes and concluded that it could help with self-management. Zrebiec and Jacobson (2001) studied an internet diabetes group over 21 months. They recorded four main topics of discussion: nutrition (42%), emotional impact of having diabetes (18%), managing high and low blood glucose (10%) and complications (8%). They also postulated that online participation had a positive effect on coping. However this internet discussion group was professionally mediated. Studies analysing the content of internet support groups for other chronic conditions suggested that users gave comprehensive information about treatments (Sandvik 1999) and being in the group helped reduce depression (Winzelberg et al 2003).

Design

Ethical approval was gained through the Research Ethics Committee of Middlesex University. No funding was sought. One of the online support newsgroups (see glossary) for people with diabetes mellitus was accessed. This newsgroup was set up to discuss issues related to diabetes and offer help and support for people within the United Kingdom. It was an unmoderated newsgroup. The contributions by participants (known as posts) were downloaded and collated. The authors initially read through the posts collected during the three months of April, May and June 2002 to give some insights into the common topics discussed. They then focussed on a cross-sectional sample of the group's activity within the posts for just one week: 6th May – 12th May 2002 (Monday to Sunday). The posts responding to a particular subject are known as threads. Several of the active threads had started before this study week and for the sake of continuity, the relevant messages from previous weeks were also collected.

Data analysis

Quantitative analysis of the group usage was carried out using a tool for measuring and mapping social cyberspaces (Netscan 2003/Smith 2001). This generated statistics for this week's posts compared to the rest of the month. It also allowed researchers to see which individuals were most active. The participants who posted to the newsgroup were not a representative sample of patients with diabetes, or the general population, but the issues discussed reflected the general concerns for people with diabetes.

The researchers analysed the data without involving themselves in the communications. This type of internet-based research method is known as "passive analysis" (Eysenbach and Till 2001). Researchers independently carried out thematic analyses and used QSR NUD*IST 4 to code the themes and categories. NUD*IST was useful for counting the code frequency, retrieve the data and joining together existing codes, but the essential task of recognising and refining concepts was done by the researchers. This produced many overall topics such as: "support", "being newly diagnosed",

"assessment", "diet", "exercise", "oral medication", "insulin", "blood tests", "investigations", "blood glucose monitoring", "work and leisure", and "miscellaneous". The researchers then went through the posts again and collaboratively revised categories into fewer overall themes. Second level coding was performed to merge sub-headings into broader categories. The final coding was done after both researchers reread the data and jointly agreed six themes.

The next stage of the research involved assessing the accuracy and usefulness of advice and information. Two Diabetes Specialist Nurses evaluated threads related to insulin and scrutinised them to judge whether the information corresponded with what they felt was accurate and useful. The themes arose from many different types of threads. The threads were noted to be questions, informational or personal experience. The informational threads within all the themes were evaluated using Loader et al's rating classification (2002) which assessed the quality of the start of the message (eg. whether the question was excellent, less good, misleading etc) as well as the reply (eg. accepted understanding, personal opinion, false etc).

Reliability was increased by involving two researchers to independently analyse the data, as well as two external nurses and another Senior Lecturer.

Results

The analysis found that there had been 32 discussions, in which 61 identifiable individuals participated. Sixteen individuals, each of whom wrote five posts or more, contributed just over 60% of messages. Out of the 32 discussions, 21 of them began with a question. The rest started with personal or general information.

Thematic analysis revealed six themes: "insulin", "diet and exercise", "oral medication", "assessment and monitoring", "complications & symptoms" and "other". There were varying numbers of threads related to the different themes, some being more common concerns than others. Table 1 shows the number of threads in each theme:

Table 1: Themes with number of threads

Themes	Number
Diet and exercise	9
Assessment and monitoring	6
Complications	5
Insulin	5
Oral medications	2
Other	8
Total (Including double-counting of threads with multiple subjects)	35

Table 2: Rating of questions (at start of thread)

Rating	Frequency
Excellent	5
Less good, some details	7
Poor, little detail	2
Vague	2
Misleading	0
Incomprehensible	0

Table 3: Rating of reply (by message)

Rating	Frequency
Evidence-based	0
Accepted understanding	39
Personal opinion	33
Misleading	4
False	2
Possibly dangerous	0

The most frequently asked questions were about diet (7), insulin (3) and the complications of diabetes (3).

Although overall 21 threads started with a question, only the 16 questions requesting information were rated. Some participants gave detailed background information with a specific question, others were more vague. Classification of the clarity of questions and accuracy of replies is shown in tables 2 and 3.

Insulin

Within the insulin theme, questions were quite technical, but generated many responses. For example, one person wondered whether splitting the long-acting insulin dose would improve blood glucose control. This generated nine replies. Another person asked if blood glucose control would improve if they changed from pre-mixed insulin twice a day to perhaps fast-acting three times a day with slow-acting background insulin. This generated seven responses. The replies demonstrated a good understanding of the recommended insulin regimes at the time (British National Formulary 2002), and included personal experiences with these insulin regimes. The discussions included explaining the effects of insulin in terms of peaks on a graph, comparing long acting human insulin with beef insulin and insulin analogues, recommending websites, and suggesting that health professionals prescribe a mix initially so that patients can get used to injections, before fine tuning the regime.

After analysis by the external clinicians, one Diabetes Nurse Specialist was impressed that individuals explained their own situation clearly and were not over zealous in persuading others to take their advice. She reflected that people offered an educated and practical account of their own experience to give advice. She didn't really agree with the animal insulin comments but admitted that it could be her personal bias towards human insulin. Regarding the discussions of whether to switch to a basal bolus regime having been on a mix, she felt that the information was very thoughtful, evidence based and accurate. She agreed that nurses do use mixes to get individuals gradually used to a needle regime before refining it into a more detailed and individual regime. She was pleased to hear the "real people" advocating the golden rule of insulin "to try and mimic what the pancreas does normally". When a participant suggested that doctors' opinions determine the treatment regimes, she felt that unfortunately this was sometimes true, as consultants are guided by the longevity of insulin regimes and by the availability of pen devices. The original posters of these two insulin questions concluded the threads by showing appreciation for all the responses. They said they would use the offered information during their next consultation with their own Diabetes Specialist Nurse to discuss changing their regimes. This suggests that participants were keen to find out about different insulin regimes from the newsgroup but still took advice from their health care professionals, before changing their insulin regimes.

Diet and exercise

In this theme there were many questions about the types of food that are better for blood glucose control. Many answers reflected the accepted advice currently given by health professionals – advocating healthy eating, explaining the significance of the glycaemic index of food (Jenkins et al 1981), and the benefit of checking blood glucose post prandially.

An example of this is when someone asks if they can use organic honey on cereals or to sweeten tea. The first reply is that they would always avoid honey, as there are too many concentrated sugars. This answer did not correspond with the current advice. Another responder corrects the previous post. They say that the occasional spoonful of honey won't do any harm, but suggests checking blood glucose control two hours after. This post goes on to show how the glycaemic index of honey compared to sugar. The individual also states that being organic is no different from other honey in relation to effects on blood glucose.

Complications

One young woman wants to have children before any complications of diabetes set in, and asks what neuropathy feels like. She admits to feeling anxious and wants to be prepared. She also asks if complications start around the five-year mark and if better control improves neuropathy. One reply is a detailed personal account of having peripheral neuropathy. The man said that it had started with reduced sensation in his feet. He gave an example of seeing blood on his feet but feeling no pain, having cut his toes on shells on the beach. He then developed random stabbing pains in his feet and toes and now has very little sensation there. He described the sensation of cold as a dull deep ache. His hands felt like he is wearing rubber gloves all the time with occasional pain - "like something being pushed down your fingernail". He wrote that he has no sensation of heat in his outside two fingers and the edge of his hand. He also has depleted sensation in his penis, tongue and lips, likened to a dental anaesthetic that has not completely worn off. His sensation of taste and smell are still present.

With regard to the reversibility of neuropathy, this man lost all feeling in half his hand but it came back after three months. He therefore thought it could be reversed in the short-term with tight blood glucose control and admits that he had poor control. Another person suffering from diabetic neuropathy thought that neuropathy did not get better. Both answers are accurate as the prognosis depends on the type of diabetic neuropathy (Tomlinson 2003). The original poster says thank you to everyone that responded and said it had been very helpful "to understand how these things actually work from people with real experiences."

A relatively young and poorly controlled person with Type 2 diabetes started a thread saying that he has been feeling depressed. He had commenced multiple drug regimes to control his raised blood glucose levels, blood pressure and lipids. He asked the group if anyone else had similar depressions, and if this could be a side effect of the diabetes. He got six responses in the week of the study. All gave personal experiences of getting low mood or depression occasionally. One answer agreed that people with diabetes were more prone to depression. This reflects the evidence that depression is twice as common in people with diabetes, compared to controls (Anderson et al 2001). Several people mentioned that their mood was worse when their blood glucose levels were high, including feeling aggressive. One said they had more energy when their blood glucose control was good. There was a heartfelt statement about the totality of the daily regime of diet, exercise and constant control being a nightmare. Another example was someone who wanted to throw the weighing scales in the bin, found excuses not to go the clinic or the dietician, and was irritable with his relatives. Supportive advice included starting with small steps to tighten up control and one person said that having a positive mental attitude really helped him. Another person said that the most important step is to bring your problems to the newsgroup, as there is always someone who has had your experiences. A further response was that they should rely on their doctors and specialist nurses for help.

Assessment and monitoring

In the assessment and monitoring theme a man with Type 2 diabetes is being sent for electromyography (EMG) and nerve conduction tests by his neurologist. He asked the newsgroup if anyone had had these tests and what to expect. He was suffering from twitching calves and the feeling of having walked through a bed of nettles, with a similar sensation in his left arm. He is extremely uncomfortable but also worried about tests. Two short responses suggested that it was not a bad experience, but another person had had several EMGs and explained the procedures in detail. He said that in his experience the tests were painful and not a pleasant experience. This is another example of the correcting role of newsgroup participants.

Oral medication

One thread was concerned with the role of

glucosamine sulphate for joint pain, and whether it had any drawbacks for people with diabetes. Two responders said they took it for their knees and it helped with pain. One person said they thought it was a long-term supplement for alleviating pain in osteoarthritis and to be used in conjunction with weight loss and exercise. Another person said she used to take glucosamine but stopped taking it, as she found it to be expensive and losing weight helped her. She also mentioned some evidence that it could raise blood glucose a little, so suggested testing it to see. She also advocated weight loss for improving blood pressure, blood glucose and lipids as well as for joint pain. Another reply included a quote from a website, which reinforced the possibility of insulin resistance with glucosamine sulphate and the need for close attention to blood glucose monitoring. The evidence for glucosamine causing insulin resistance and raising blood glucose levels is documented in animal studies, but so far inconclusive in humans (Reginster et al 2001) although experts agree that people with diabetes using this supplement should monitor their blood glucose levels.

Discussion

The number of posts showed that this is an active support group used by many people with diabetes. Some people appeared to be frequent contributors to the group who seemed confident and accurate in their responses. Others only made one communication during the week of the study. It is useful to remember that other people access the newsgroup and read the postings to perhaps find answers to their own diabetes-related issues. This is known as "lurking".

Despite the short time frame of this research, the common topics of discussion (diet and exercise, insulin, complications, assessment and monitoring, oral medication) were similar to that documented in previous research (Zrebiac & Jacobson 2001, Loader et al 2002). Topics reflected the education priorities highlighted by trainers in "Expert Patient" pilot programmes, although none of the participants mentioned being involved with these. The majority of advice and information given in response to questions corresponded with the accepted understanding and there were no replies that were possible dangerous. None of the informational responses could be classed in Loader's highest rating: "evidence-based", but this is to be expected considering that lay people use the support group. A new rating scale is being developed to assess the accuracy and usefulness of information for future studies.

It was interesting to note the correction of information when a few respondents gave

misleading or false advice. This demonstrated that some people had expertise in various issues in diabetes and had an ongoing interest in contributing to the group. Discussions referred to mainstream treatment issues, (apart from the discussion of the supplement glucosamine for osteoarthritis), rather than advocating complimentary or alternative therapies as seen on many health websites. Although there was occasional criticism of health care professionals, most posters were respectful of the advice given by nurses and doctors involved in their care.

The shared language of internet discussion was noted. Some posts were in note form and abbreviations such as FWIW (for what its worth), IMHO (in my humble opinion), YMMV (your mileage may vary) etc were widespread. Certain people contributing to the group used humour regularly, especially when discussing serious issues. They also had an informal style of writing with slang words and expletives. In the diet and exercise theme there was an argument about low carbohydrate diets, but mostly posts were friendly. Another observation was that threads could be side-tracked by unrelated issues. The sixth category was labelled "other" to cover all the "off topic" and miscellaneous threads. For example when one thread started with someone inviting others to participate in a diabetes-related survey, this was categorised as "other". This appeared to demonstrate the relaxed familiarity between some participants, which welcomed others to join in the discussions.

Although, the sample was small, not randomised and did not represent all people with diabetes, it was an appropriate sample to explore the concept of self-management. People who used the diabetes newsgroup were articulate, had access to computers and seemed motivated to gain knowledge in managing their diabetes. There were no interventions by health care professionals. Participants referred to books and websites as their source of knowledge.

Considering the expansion of computer technology, this is an under-researched area. Future studies will include a longer time frame to produce a much larger sample.

Ethical considerations

The issue of informed consent was relevant to this research, despite the passive nature of the analysis. Eysenbach and Wyatt (2002) discussed the individual's perceived level of privacy when communicating with other newsgroup participants. They defined a scale starting with private emails (having the highest privacy rating), and then chat

rooms, mailing lists, newsgroups and websites (having lowest privacy rating). Although the newsgroup was not perceived as private, gathering and analysing individuals' posts could be construed to be intrusive. Therefore researchers followed the technique used by Sharf (1999) by analysing the communications retrospectively and only contacting participants whose direct quotes were used.

Conclusion

Diabetes mellitus is becoming more widespread. It is a serious progressive illness that has physical, psychological and social implications. People with diabetes in the United Kingdom have access to health professionals at clinics and support groups to help with the long-term management of their illness. Diabetes self-management programmes are also being introduced to train people to cope with the day-to-day tasks of living with diabetes. This research shows that the internet newsgroup studied is also a source of information and support to many people. The group provides an environment for gaining companionship and hearing about the experiences of peers, without having to travel or meet people face to face. In addition to this, the quality of information suggests that patients can become experts in their knowledge of their disease, without formal training.

Glossary

Internet – the global computer network providing a variety of information and communication facilities to its users, and consisting of a loose confederation of interconnected networks which use standardised communication protocols.

Website – a document or a set of linked documents, usually associated with a particular person, organisation, or topic, that is held on such a computer system and can be accessed as part of the World Wide Web.

Newsgroup – a forum on a network, especially the internet, for the discussion of a particular subject and the exchange of information about it; a group of internet users who exchange email messages on a topic of mutual interest.

Chat room – an online messaging facility (especially an internet site) dedicated to real time exchange, usually on a particular topic, a notional space occupied by two or more, particularly in an online chat service.

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A European project (DayWater) investigating the integration of stormwater source control into sustainable urban water management strategies

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Abstract

The rapid expansion of urban areas across many parts of Europe has placed increasing importance on the effective management of stormwater. The traditional approach of directly draining stormwater flows to the nearest watercourse is no longer considered to be the optimal solution as it ignores the potential impact of stormwater discharges on receiving waters and also places great demands on the drainage system. This has led to the need for a new approach to urban stormwater management (USWM) and increasing interest has been shown in the use of best management practices (BMPs) as a sustainable solution for stormwater control. There are many different types of stormwater BMPs and there exists a clear need for a methodology to enable end-users to select the most appropriate stormwater BMP for their catchment area. DayWater is a three-year EU funded programme bringing together urban hydrologists, computer software developers and end-users from across Europe to jointly address this issue. The key goal of DayWater is to develop an adaptive decision support system (ADSS) that will assist end-users throughout Europe to use catchment-specific information to make the best decisions with regard to stormwater management. Development of the ADSS will involve a risk assessment of stormwater management projects, analysis of the performance of BMPs under varying European conditions, development of an urban sources and flux model and an assessment of how stormwater management interacts with other urban processes and policies. This paper introduces the members of the DayWater consortium, describes the various components of the ADSS and how they will be developed and concludes with an update on the progress made since the project commenced in December 2002.

Keywords

DayWater, stormwater management, BMPs, ADSS.

Introduction

The construction of buildings, roads and other impermeable surfaces drastically alters the natural hydrological cycle (Revitt et al., 1999), greatly increasing the volume and flow rate of stormwater runoff. Urban runoff can mobilise pollutants which have collected on pavements, roads and other surfaces, and may therefore also have a significant pollutant loading (CIRIA, 2001). The traditional approach to managing urban runoff is to directly drain stormwater flows to the nearest watercourse to prevent flooding (Scholes et al., 1998). However, this approach is no longer favoured as it can result in a range of negative impacts in the receiving watercourse, from the restriction of aquatic ecology to pollution tolerant families to flooding and erosion downstream. In addition, the rapid expansion of urban areas in many parts of Europe is placing existing drainage systems under increasing pressure, with the capacity of some urban systems unable to cope with the increased volumes of stormwater (Legret and Raimbault, 2003, NTUA, 2003). A further issue is the development of new EU regulations, such as the Water Framework Directive, under which it is anticipated that the legal requirements for the control of stormwater will become much more stringent.

A new approach to urban stormwater management (USWM) is therefore required, and this recognition of a need for change has led to increased interest in the use of best management practices (BMPs): also known as sustainable urban drainage systems (SUDS). BMPs encompass a wide range of structural (e.g. retention basins, constructed wetlands and porous paving) and non-structural measures (e.g. road sweeping, snow management practices and reductions in pollutant usage), which enable the planning, design and management of stormwater to be tackled equally from hydrological, environmental and public amenity perspectives (CIRIA, 2001). BMPs aim to treat stormwater as close as possible to its source, reducing runoff

volumes and flow rates by collecting, temporarily storing and subsequently discharging stormwater at a controlled rate to the soil, receiving water or sewer system. In addition, the use of BMPs can also enhance the urban environment through their potential for multifunctional use, whereby, for example, a retention basin could provide both stormwater storage and habitat for wildlife.

Aims of the DayWater project

Although the use of BMPs for stormwater have been widely investigated, the available information is fragmented and there is no overview of how different BMPs perform under various conditions. This is important, as urban areas are highly variable and complex, and factors such as topography, climate, traffic density, land use, land availability and housing density can vary greatly even between two neighbouring catchments. There is, therefore, a clear need for an information advisory tool such as an adaptive decision support system (ADSS) to enable the identification of the most suitable and cost effective solutions for a range of urban situations. The provision of such a system is a key objective of the DayWater project. DayWater also aims to characterise the decision making process, promote the use of stormwater source control and integrated water management in urban policy making and catchment area management, disseminate technical information on BMPs and provide models for the analysis of pollution loads and environmental risk assessment.

The DayWater Consortium

DayWater is a 3 year international research project which commenced in December 2002. DayWater is funded through the 5th European Framework Programme, and is part of the CityNet project cluster of six individual research and development projects which focus on various aspects of integrated urban water management. The DayWater consortium currently consists of ten research partners and fourteen core end-users (CEUs) from a total of eight countries (see Table 1), although the end-user group is currently being expanded within each partner country and will eventually involve a total of approximately one hundred participants. The research partners cover the disciplines of civil engineering, environmental science, urban hydrology and software engineering and the core end-users include water companies, local authorities and private developers. The countries involved reflect the range of climatic conditions experienced in Europe, from cold weather in the north to mediterranean countries in the south. Strong emphasis is placed on close collaboration between the research partners and the CEUs to ensure that the relevant issues are addressed in a user-friendly format. As mentioned above, the end-user group is currently being extended to approximately one hundred members (to be known as the extended end-users (EEUs)) who will provide further input and feedback on the ADSS as it develops, but will not be as closely involved as the CEUs.

Table 1: The DayWater Consortium

Country	Research partner	Core end-user
Czech Republic	DHI Hydroinform	
Denmark	Technical University of Denmark	Copenhagen Energy, Karlebo Municipality
France	Cereve at Ecole Nationale des Ponts et Chaussées, Laboratoire Central des Ponts et Chaussées	Living Marne, Seine St-Denis County Water Authority, Water Authority for the Seine- Normandy Bassin
Germany	Ingenieurgesellschaft Prof. Dr. Sieker GmbH	Sewage Department, City of Dresden, Water Authority of Wupper Bassin
Greece	National Technical University of Athens	Greek Ministry of the Environment and Public Works, Municipal Water Supply and Sewage Company of Patras
Netherlands	TAUW	City of Nijmegen
Sweden	Lulea University of Technology, Chalmers University of Technology	City of Lulea, City of Stockholm
UK	Middlesex University	Countryside Strategic Projects plc, Harrow Engineering Services (London Borough of Harrow)

Development of the ADSS

The DayWater work programme has been divided into seven research tasks or areas as follows:

• Project co-ordination and dissemination of results
This element of the work programme is mainlyconcerned with the overall organisation of the project in order to ensure its successful completion. It also oversees all the internal and external communications related to the programme.

• Adaptive decision support system
This part of the work programme uses the information generated by the other programme research areas and end-users to develop the ADSS. It will establish an iterative and incremental procedure between ADSS development and its testing by end-users to ensure that the decision support system adapts to their needs.

• Urban dynamics
The main purpose of this part of DayWater is to identify how urban stormwater management (USWM) decisions are interconnected with other processes within a city or urban environment, and to propose tools to help decision-makers visualise the complexity of the system and make the best decisions. This complexity exists in the highly multiple and changing use of space in urban areas as well as in the decision making process itself where participants from spheres other than USWM need to intervene and share their concerns.

• Risk and impact assessment
This component will provide a methodology for the evaluation of environmental risks associated with stormwater related projects. In the first phase, the risks associated with stormwater management will be outlined and characterised. The second phase will involve the development of a methodology to determine the environmental risks associated with the discharge of stormwater runoff to surface waters, soils and groundwater. Potential stormwater priority pollutants and their hazards will be identified, together with their sources in the urban environment. In addition to analysing individual stormwater pollutants, biotests will be used to assess the potential ecotoxicological impacts from stormwater discharges and a simplified methodology will be developed to analyse the vulnerability of ecosystems to these eco-toxicological effects. Finally, a screening tool will be produced as a three-step process involving (i) vulnerability analysis, (ii) simple risk estimates assuming that all pollutants are transferred directly into environmental compartments and (iii) advanced risk estimates accounting for the ability of various BMPs to reduce the concentrations of identified stormwater priority pollutants.

• Multi-criteria analysis of structural and non structural BMPs
There is a need to evaluate the sustainability of BMP's against multi-criteria and multi-objectives, and this part of DayWater will provide end-users with generic and specific approaches for the quantification and evaluation of urban stormwater sustainability. Such multi-criteria approaches should incorporate technical and scientific information, a risk and sensitivity assessment and also be flexible and dynamic in order to allow review and adaptation to meet the changing requirements of organisations, regulations and customers. Case studies will be used to calibrate the selected criteria and benchmark standards will be selected for the assessment of BMP performance under varying European conditions. The resulting multi-criteria approach will offer a standardised methodology of decision-support which will be understandable from both regulatory and public awareness viewpoints, and which can be incorporated into the ADSS to provide an overall framework which is of direct practical use to all end-users.

• Sources and flux model (SFM)
The main objective of this research task is to design a software framework for the simulation of urban runoff sources and fluxes. Using a hydrological model and a GIS-based topological representation of the catchment identified for field-testing, the SFM will enable an analysis of the sources and fluxes of the priority pollutants identified in the risk and impact assessment part of the programme. In addition, the information and data on the use and performance of various structural and non-structural BMP's generated by the multi-criteria evaluation of BMPs (as described above) will be incorporated into the SFM tool. The SFM will be part of the ADSS, and will facilitate the comparison of various USWM solutions involved in the case studies.

• Field testing
This part of the research programme involves the field testing of the ADSS as it develops, testing and proposing improvements to the different components to optimise processes and enabling identification of the best solutions from the point of view of the end-user. There will therefore be strong links between this component, the end-users and the ADSS development component, in particular. This part of the programme will define and update terms of reference for the ADSS and the components to be field tested, set-out a methodology for testing and reporting and analyse field test data, using the results to propose modifications to the ADSS and continually feedback results into the ADSS development process.

Each research task has a leader with, for example, Cereve at ENPC, Paris, taking the co-ordinating role and Middlesex University taking the lead on the evaluation of BMPs. However, as indicated in the above section, the various components of the work programme are not discrete units developed in isolation. There is considerable interaction between partners, to share areas of research expertise and country-specific information, and between partners, CEUs and EEUs, to obtain feedback as the ADSS develops and to ensure that the ADSS is the stormwater management tool that end-users require. For example, although Middlesex University is the lead partner on the multi-criteria analysis of BMPs it also contributes to the co-ordinating, ADSS development, urban dynamic and field testing components, and particularly to the risk and impact assessment part of the programme. Middlesex University is also working closely with the UK CEUs, Countryside Strategic Projects plc and the London Borough of Harrow Engineering Services.

The exchange of information between research partners and end-users will take place via a variety of formats including attendance at meetings and seminars, completion of questionnaires and on-line exchanges through the DayWater website at www.daywater.org . Partners and end-users will also be kept up-to-date on the progress of the project through "DayWater News", a bi-annual newsletter.

Conclusions

DayWater was launched in December 2002 with an initial kick-off meeting held in Paris, France (6–7 December, 2002). All areas of the work programme are now up and running and the first work meeting was held in Riksgransen, Sweden, on 23 March 2003. Each CEU has completed a detailed questionnaire giving information on a range of areas including current stormwater management practices, local legislative requirements and the interactions between stormwater management and other areas of urban living. The process of extending the end-user group is underway, with regional conferences being planned in each of the partner countries. With specific regard to the UK, a flyer has been prepared for circulation at the Second National Conference on Sustainable Drainage (Coventry, 23-24 June 2003) to attract potential end-users to the UK regional conference scheduled to take place on 4 November 2003 in North London. A draft of the first required deliverable for the evaluation of BMPs research task (a review of the use of BMPs across Europe) has also been completed and this has been submitted to an internal referee for comments. The first "DayWater News" update, containing general information on the project along with contact details for the members of the consortium and an interview with one of the CEUs has been produced and is available on-line at

the DayWater website. The first management report on the progress of DayWater is currently being prepared for EU approval, with the first annual meeting of DayWater scheduled to take place in Athens, Greece, 16-17 October 2003.

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INTRODUCTION
Conscious robots — could we, should we, create them?

The following two papers are based on presentations by the authors, Steve Torrance and Souzy Dracopoulou at a Public Symposium of the Hampstead Scientific Society, during 'Science Week', in March 2003, to discuss current and future developments in artificial intelligence and robotics, with particular reference to artificially produced conscious agents. Both papers support a sceptical view of the feasibility and the social desirability of the creation of conscious robots, and both stress the saliency of the moral questions raised by artificial consciousness (AC). The first paper suggests that AC is importantly different and discontinuous from, artificial intelligence (AI). The former will not simply emerge automatically as AI products become more and more sophisticated.

The project of AC (indeed consciousness in general) bears a special relation to moral concerns. The second paper stresses the links between moral questions concerning AC and issues concerning biotechnological innovations such as genetic engineering, as well as mainstream ethical issues concerning the value of life and personhood.

These presentations were given alongside two others, by Igor Aleksander (Emeritus Professor of Neural Systems, Imperial College, London) and Martin Smith (Professor of Robotics, University of Central England). The latter symposiasts viewed the production of conscious robots in a more optimistic light, both as to its imminence and as to its desirability. The symposium was chaired by Christine McGourty (BBC Radio 4 Science Correspondent).

Could we, should we, create conscious robots?

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Abstract

Researchers in Artificial Intelligence (AI) and robotics often argue that, as computers get more and more sophisticated in their cognitive abilities, Artificial Consciousness (AC) will automatically emerge - that is, that there is an essential continuity between cognition and consciousness. To challenge this idea, I distinguish between psychological monist and pluralist views of mind. A psychological monist assumes that if some processes of mind are computational in nature, then all must be; a pluralist can accept that computational devices could embody genuine mental properties of one sort (cognitive ones) while being closed to mental properties of another sort (qualitative states of consciousness). The question is not just an abstract philosophical one: the project of AC has important moral implications that the project of (merely non-conscious) AI doesn't. So maybe it's just as well that AC is not likely to be achievable using computer-based technologies - although it might be created via the simulation of deeper, more biological features of humans or other organisms.

Keywords

Artificial intelligence, artificial consciousness, robotics, psychological monism, ethics.

Artificial Consciousness (AC) should be distinguished from Artificial Intelligence (AI) and from what is sometimes called situated robotics, or 'nouvelle' AI. AI is often defined as getting machines to perform tasks that would need intelligence if done by humans. A commonly cited example of that is Deep Blue (Hsu, 2002) – a chess program, using rather traditional search techniques but advanced parallel hardware - that can beat even top world-class chess players; another is NETtalk (Sejnowski and Rosenberg, 1987) – an artificial neural network program that is trained to convert typewritten text into speech sounds. Both these types of AI system live in an isolated 'desk-top' environment, not in the real world. Work in situated robotics includes the development of insect-like creatures, which can navigate successfully over rough terrains – some of this technology is going into autonomous robotic vehicles exploring Mars (Brooks, 2002; Matijevic, 1998). All these cases – the desktop ones and the real world ones - involve machines doing things that might normally be expected to involve the possession of mind.

Do such systems genuinely have mind or intelligence? There is a lot of controversy about all this: many have argued it's all just fake intelligence, fake mind. One principal reason offered is that in order to have a mind you need to be conscious, and the designers of such systems don't make any claims that the systems are conscious. But, is there perhaps, at least a minimal sense of 'mentality' in which these AI systems can be said to have it, and maybe even simple calculators? 'Productive' mentality we might call it (Torrance 2000). The idea would be that, if a computer system can accomplish tasks that get real results – winning a chess game, or being able to reliably differentiate photos of cats from photos of dogs - then it really will have displayed productive mind: it will be an artificial system that will have produced results that would normally require a mind. Notice that this view could be put forward independently of whether there is thought to be any genuinely conscious experience or 'phenomenology' or internal 'point of view' accompanying the intelligent performances in the system - whether there is anything that 'it is like' to be such a system. Notice also that we are here talking of non-robotic, 'desktop' systems: even systems of this non-situated kind, it could be argued, may display productive mind in this minimal sense.

Even if non-robotic desktop systems don't have 'productive' mentality, then, it may be said, embodied robots do - if they can perform physical activities such as successfully navigating across a rugged Martian terrain; picking up mineral samples, etc. - or (closer to home), playing a passable game of billiards; walking a tightrope, etc. Such performances can be said to involve kinds of

intelligence or adaptivity which are grounded in the physical 'body' of the robot, and in the physical environment in which the robot is situated. Such situationally grounded activity does seem to involve a certain kind of mind-like capacity, even, again, if no consciousness is present.

I find such ideas interesting and suggestive. They suggest that, in an important sense, the computational development of AI bypasses consciousness, and differs markedly from how AC might be thought to develop. The latter has to do, I would think, with reproducing different features of mind from those discussed above – with what might be called the 'subjective' aspects of mind, rather than with the 'productive' aspects highlighted in the previous examples. So, unlike a merely AI robot, an AC robot would have to be endowed with feeling rather than just with the capacity to perform certain tasks, or solve problems or display successful adaptive behaviour of various sorts. If so, then grounding in a physical body and a physical environment wouldn't be sufficient for AC, even though it might be sufficient for certain kinds of artificial mentality – 'productive' mentality, as I have called it.

People often talk of a person's consciousness (in contrast to their behaviour) as being 'first-person', and therefore as inscrutable, unknowable by the outside observer. Consciousness seems to be much more about something going on 'inside' than with externally observable productions or performances. This raises an obvious problem: if an AI robot does something clever, we can see the cleverness displayed in its performance. If you behave-as-if you can beat someone at chess, or explore the Martian surface, then in a key sense you can really do it. But how would we know whether an allegedly AC robot really was conscious, rather than just behaving-as-if it-were-conscious? Unlike disembodied and robotic AI, trying to develop consciousness in robots looks a bit like running a race where no one has any way of telling when the winner has got past the finishing line!

There is a view popular amongst those who favour computational approaches to the mind, which might be called the Continuity Thesis. According to this view, as AI systems increase in sophistication and versatility, genuine, and not just 'lookalike', AC will emerge, as a by-product of the system's organizational complexity. Underlying this view is an even more fundamental conviction - that there is no real distinction between the cognitive or adaptive aspects of mind on the one hand, and the subjective or phenomenological aspects on the other. We might call this underlying view

'psychological monism' - because it insists that the mind is an explanatory unity.

I am suggesting an alternative possibility - perhaps some basic features of mind can be explained and replicated by computational means, but others are resistant to such a framework. Why, after all, should 'the mind' form an explanatory unity? Perhaps that is one folk psychology prejudice that should be set aside, at least while we review alternative possibilities. (Torrance, 1998, 2000).

Independently of the issue concerning psychological monism, one doubts whether AC will simply appear as AI systems become more sophisticated. Is consciousness the sort of thing that can automatically emerge out of more complex computational or robotic systems, built out of present day components – chips, servo devices, etc.? Even if you thought the answer to this was no, you might still think that one could build genuinely AC beings by simulating much more closely the biological structure of naturally conscious beings, using technologies that we can maybe only dream about today. To dismiss the idea of computational AC, then, is not necessarily to reject the possibility of the emergence of genuine AC via other forms of replication.

Many early AI theorists were disdainful of investigating the neurophysiological or biological make-up of real organisms. Biologically-inspired AI and robotics has recently become much more fashionable (Steels and Brooks, 1995; Di Paolo, forthcoming). However it could be argued that there is a particularly strong relationship between consciousness and living organic systems - much stronger than the corresponding link between intelligence and biology. Consciousness, at least sentience, which includes the ability to feel certain kinds of pleasures and pains, seems to be attributable to even quite lowly creatures in the animal kingdom. So 'core' consciousness (Damasio, 2000), may itself be quite a widespread biological phenomenon stretching back far through evolutionary history – even if more sophisticated forms of self-consciousness and self-reflection, are dependent on fairly advanced communication abilities, and are found only in relatively large-brained creatures.

So it looks as though the most likely route towards developing 'real' artificial consciousness (as opposed to 'simulated' artificial consciousness) would be through what might be called artificial organics – trying to simulate evolved biological organisms much more closely than is done through current robot-building technology. A few people

working in robotics actually hold this view today, but there is little agreement on how to make progress on it. There are various technologies in their infancy (such as creating artificial living meat in laboratories, as well as nanotechnology techniques, etc.) which may bridge the divide between the mechanical and the organic in various ways. Certainly it seems to me that it would be harder to be sceptical about the consciousness of supposedly AC beings that were developed in that way. In any case, consciousness seems clearly to be very closely tied up with sentience, with pleasure, pain, motivation, purpose, etc., in ways that seem to be quite outside the scope of current work in AI and robot building.

Finally, and to my mind most crucially of all, the notion of consciousness seems to be much more closely bound up with ethical considerations than is the notion of intelligence (or mental 'productivity'). Hence AC seems to have an important moral dimension that seems missing - or at least less prominent - in the case of AI. It seems difficult to disentangle our idea of consciousness from moral notions such as suffering, exploitation, injustice, and so on. Indeed it might be said that a good definition of 'real' AC (as opposed to 'merely simulated' or 'fake' AC) is just this: that when genuine AC occurs, genuine moral questions of how to treat the beings possessing it will also come to the fore.

One could dramatize this last claim by means of the following imaginary example. Suppose you work in a research institute that has built lots of supposedly artificially conscious robots, that have sophisticated language abilities, and which can talk about their 'feelings' and so on. One day you decide to take them on a trip – to the seaside, let's say – as a treat. On the way there is a terrible smash: the coach is in a head-on collision with another coach containing a number of school children. There is limited time, and rescue services are very limited. You have lots of bodies that need to be rescued, with various cries for help, etc., coming both from the injured school kids and the injured robots. Here are some options to consider.

• Do you take the schoolchildren first, on the grounds that one should always put human suffering before the suffering of other kinds of creatures (a sort of 'species-loyalty')?
• Or do you give greater priority to the children, not (just) because they are humans but because they are naturally-occurring, living organisms, as opposed to manufactured (even if 'artificially alive') systems (a sort of 'bio-loyalty')?
• Or do you give equal priority to the robots and to the school children? (After all, if the robots are

genuinely (though artificially) conscious surely they deserve as much moral consideration as the schoolchildren?)

I think this thought-experiment shows that the question of when you actually have achieved AC has a moral dimension to it, which perhaps is missing in the case of purely 'productive' AI or situated robotics. Being a conscious creature seems to be, not just about having capacities to feel things, but also about being deserving of certain kinds of moral consideration. We surely need to be discussing the moral implications now. Moreover, even if the kind of AC which raises these direct moral issues is a long way ahead of us, various kinds of lookalike AC systems may be developed much sooner - systems that many people may (albeit misguidedly) take to be genuinely conscious, and which may therefore raise moral and social issues of another sort. A world full of robots with simulated (but not real) consciousness may occur quite soon, unless we decide that it needs to be limited by legislation. And such a world will raise deep social problems of other kinds, even if the robots themselves don't have any intrinsic moral worth because they are only apparently conscious and not genuinely so.

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The ethics of creating conscious robots - life, personhood and bioengineering

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Abstract

This paper examines two questions that might arise in relation to the possibility of creating conscious robots: (a) If we could create conscious robots, what would their moral status be? Would they be entitled to moral consideration protection and respect? (b) Assuming that such entities would qualify for moral concern, would it be morally permissible to create them? In response to the first question the paper discusses the issue of the value of life and supports the view that persons only - and not all human beings - have very special, intrinsic value. It argues, moreover, that it is the complexity manifested in the characteristics of personhood that is responsible for this value. However, the concept of a person is not species-specific, so beings from species other than our own, e.g. creatures from other planets or some animals or, indeed, artificially conscious entities, could be persons - and thus qualify for the moral protection and respect that persons do. In response to the second question it is argued that, if conscious robots could have the same moral status as human persons, then some of the concerns that might arise about the possible creation of these entities would not be dissimilar to some of the concerns often expressed about 'eugenic' genetic engineering - concerns for example about risks or about who would be entrusted with decisions about new forms of life.

Keywords

Value of life, artificial consciousness, personhood, intellectual, emotional and social (IES) complexity, eugenic genetic engineering.

In his contribution Steve Torrance has stressed the connection between artificial consciousness and morality. What I would like to do is to discuss this connection further and support it, and to ask whether it would be morally permissible to create conscious robots.

Suppose that we could build robots with 'real' consciousness (in the sense of " 'real' " that Steve Torrance contrasts to " 'simulated' "or" 'fake' "), whether these are purely mechanical or biomechanical or fully biological/organic systems. What would their moral status be? Would they be entitled to moral consideration, protection and respect? Would they be objects of duty?

An immediate answer to this could be that it depends on what these entities are made out of or, to use more appropriate terminology, on the principles on which they are designed. So, it might be said, if they are living organisms, made of organic material, or if they are designed on 'organic' principles to be artificially living beings, then it would make sense to see them as deserving moral concern. And there could be something in this, in the sense that a non-organic being may be in principle incapable of consciousness (an influential view amongst cognitive scientists and the view that Steve Torrance supports). But if we don't make the connection between being organic and being conscious - and at the moment we are only in a position to say that there is arguably a strong likelihood of there being such a connection - then the question about their moral status remains.

At this stage it would be helpful to discuss the issue of the value of life. The prevailing view in the West is that human life, in the strictly biological, species sense of 'human', has very special, intrinsic value, which distinguishes it from any other kind of life (Singer 1993).This view is clearly exemplified in the efforts we make to save a human life, even if it is of very low quality (think of such efforts in relation to, for example, persistent vegetative state patients or severely defective newborns), in anti-abortion, pro-life movements or in our resistance to accept that there may be a right to end one's life. It is equally exemplified in how, by contrast, we treat animals, - we experiment on them, often totally unnecessarily, we farm them in cruel ways, we eat them.

This view has its origins in the Judaeo-Christian tradition, in which human beings (all members of our species) are seen as having been made in the image of God, with immortal souls etc. By contrast,

animals are believed to have been created by God for man's use only (Singer 1993). Indeed, in the context of this 'doctrine of the sanctity of human life', we are not constrained by any moral considerations in our relationship with animals, except where, as Aquinas or even Kant suggested, by being cruel to them we might affect some human beings (Passmore 1975). It is interesting to mention here that in his attempt to deny any moral significance to causing unnecessary suffering to animals, Descartes in fact denies that animals can have any feelings whatsoever (Descartes 1965).

However, in a secular context, the view that human life has very special value, distinct from the value of beings from other species, cannot easily be defended - although there have been various attempts to argue in its defense (Steinbock 1978). The biological characteristics which distinguish humans from creatures of other species are not morally significant (Singer 1993). To think that they are is to be in the same position as the racist or the sexist who thinks that, for example, the colour of the skin or the sex of an individual are morally relevant (hence the term 'speciesism' used in discussions opposing the prevailing view). A more defensible position would have to appeal to features other than membership of a species to explain the special, intrinsic value of a being.

A number of views can be found in the philosophical literature as to what these features might be, ranging from the view that simply being alive is intrinsically valuable to the view that personhood is what gives an entity special, intrinsic value. While being a mere functioning biological organism, without any consciousness, can hardly be defended as an intrinsically valuable state, the view that personhood gives the entities that possess it unique, intrinsic value seems undeniable.

A person is a being with at least some degree of rationality and self consciousness or self awareness (Harris 1985; Singer 1993). Other characteristics associated with personhood, not unconnected to rational self-consciousness, are: a sense of the past and the future, the capacity to use sophisticated language, to interact with others and care for them, autonomy. It is the intellectual, emotional and social (IES) complexity that this cluster of characteristics manifests that offers special, intrinsic value to the entities that possess them. One way of appreciating the moral importance of IES complexity is to think of the great harm - and, we would undoubtedly agree, moral wrong - that would be done to a being of such complexity if its life came to a sudden end: a wide range of activities in which it would be engaged would be cut short, a rich variety of experiences that it would have would

be precluded, its desires and plans for the future would be frustrated, its hopes and aspirations would be unfulfilled, its intricate personal relations would come to a halt, its autonomy would be violated. It would be obviously less of a misfortune if the life of a less complex being came to a sudden end (Rachels 1986, Dracopoulou 1990).

One implication of this view is that lives have value, and qualify for moral concern and protection, in proportion to their IES complexity. So, for example, a being without any consciousness or sentience - without any 'emotionality' - has no intrinsic value, while the IES complexity that underlies the characteristics of personhood offers the highest intrinsic value to a being, and makes it the subject of the most serious moral concern and protection. Another implication, and one which brings us back to the issue of the moral status of conscious robots, is that personhood cuts across species. So an animal (e.g. a chimp or a whale) could possess the characteristics of personhood, while a member of the human species (e.g. a PVS patient, a fetus, an embryo, a newborn baby!) could be a non-person. A hypothetical creature from another planet, with a totally different constitution from ours, could be a person. A hypothetical robot, whether this is a mechanical or biomechanical or an organic system, could be a person. To the extent that such a robot had some rationality (intelligence), some high level consciousness and some of the other characteristics of personhood, it would be indistinguishable, from the point of view of intrinsic value and suitability for moral consideration, from other creatures, with different constitution, but equally in possession of rationality, self-consciousness and some other personhood characteristics. Needless to say that, in accordance with the first implication mentioned above, a hypothetical robot with some low level consciousness could still have intrinsic value, and qualify for moral concern, but only in proportion to its complexity with respect to consciousness and some other relevant characteristics.

In view of the moral status, as defended above, of 'real' artificial consciousness, the question might arise as to how these entities, were they to be created, should be treated. But an even more urgent question, and the one that I will briefly address below, is whether it would be morally permissible to create them. It might be thought, of course, that asking this question is extremely premature, in view of where we stand technologically today. However, future possibilities can become present realities much faster than we often anticipate, and it is incumbent upon us to think of these possibilities well in advance and make preparations for them.

If conscious robots were of the same moral status as human persons, then some of the concerns that we might have about the possible creation of these entities would not be dissimilar to some of the concerns that some of us now have about human genetic engineering - a variety of methods that could be used to manipulate human genes, and hence change or shape human characteristics. We can distinguish two different kinds of genetic engineering in humans, although the distinction is not always clear: therapeutic genetic engineering, where genes are manipulated in order to treat certain genetic diseases, and eugenic genetic engineering, where the aim is to produce individuals with certain desirable qualities. These two kinds are morally very different (Singer and Wells 1984). There is no doubt that curing people from terrible diseases, as genetic diseases usually are, is a very good thing. But serious reservations can arise at the prospect of manipulating human genes - and ultimately creating new forms of life - in order to come up to some sort of plan or ideal. Here are two of these reservations, or types of reservation, extended to also apply, as I think they do, to the case of creating conscious robots:

The risks that are involved, to ourselves as well as to the genetically altered or artificially created beings. What if the beings that we produce by genetic manipulation or artificially turn out to be not as expected? What if they turn out to have defects or disabilities or deformities that cause them tremendous physical or psychological suffering or both? What if, by mistake, what we produce are aggressive, violent beings who turn against us or take us over? It could even be the case that these 'different' creatures are discriminated against and rejected by society and there is a social and political upheaval. When contemplating some of these disastrous possibilities one cannot help being reminded of Mary Wollstonecraft Shelley's 'Frankenstein', where the young scientist who discovered how to create life made, unwittingly, a half-human monster (Singer and Wells 1984).

If by using biotechnology and/or robotics it becomes possible to alter human life and to create new forms of life (or I should say 'life'), who can be entrusted with such decisions about what sorts of creatures there should be? (Glover 1984). Imposed centralised decisions could be seen as giving rise to the danger of situations not unlike the Brave New World scenario of Aldous Huxley's novel, where persons are manipulated and enslaved. Decisions by a group of people or by a whole society would be inevitably limited by particular sets of values and outlook. (Think for example of a group of roboticists deciding about what kinds of creatures

there should be.) The point here is that we seem to lack the moral objectivity, the 'God-like perspective', in Glover's words, that would be required for making decisions, by and large irreversible, about the creation of new forms of life (or 'life').

The above are just two types of reservation (among, I am sure, many) one may have about the creation of conscious robots. Obviously the case about the morality or moral permissibility of the creation of such entities cannot be decided on the basis of these reservations alone. However these concerns are sufficient ground for saying that, as technology in robotics develops at an ever faster rate, we should not move blindly where it leads. We need rather to exercise extreme caution. There are undoubtedly benefits involved here as well. Ultimately the case can only be decided when we are in a position to set all the possible problems as against all the possible benefits. My hunch is that the dangers will outweigh the benefits.

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BOOK REVIEW:
Workman, B. A.; Bennett, C. L. (2003). Key Nursing Skills
London: Whurr Publishers

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Once upon a time nursing procedure books resembled collections of (slightly exotic) recipes. Each procedure began with a list of the pieces of equipment required followed by minutely detailed instructions on what to do with them. There were recommended volumes, quantities, temperatures and timings, for example an "evacuant enema" required 90 ml (3 fl oz) of enema soap concentrate to be dissolved in 500 (1 pint) ml of water at 37°C (98.6°F) to be retained for a (usually unachieved) period of time. If you followed the procedure all would be well – and most of the time it was.

But what if you wanted to know the reasons behind a procedure? Why are we painting the broken skin on this patient's buttocks with egg white and then blasting the affected area with oxygen? Why are we dabbing a mixture of glycerine and lemon juice onto this patient's tongue? Why for goodness sake are we cleaning his mouth and teeth with a bit of cotton wool on a stick instead of a toothbrush? You would have looked in vain for answers to these questions in the hospital procedure book, and the authored and published procedure books of the day would not have satisfied your curiosity either.

All this changed in 1984 when the first edition of the Royal Marsden Manual of Clinical Nursing Procedures was published. In its current 5th edition it is a formidable collection of procedures, from basic nursing care to some of the mysterious skills recently acquired from doctors, with a full armament of references to support recommendations and identify areas of doubt or uncertainty. It is a superb book but its encyclopaedic nature means that much of its content is of marginal relevance to the needs of many nurses, and particularly to nursing students. This is where Barbara Workman and Clare Bennett's excellent new book displays its strengths.

As the title indicates it deals with what the authors identify as key nursing skills, the foundations of basic nursing care on which all other aspects of care depend. It is good to see a book that devotes itself entirely to exploring these issues, which sometimes appear to be neglected among the ever-increasing demands to increase nurses' technical sophistication. These key nursing skills are contained in twelve chapters, which include chapters dealing with assessment, observations, personal hygiene and preventing the complications of bed rest. The procedures are there all right but they are integrated into the most appropriate chapter and the reasons underlying them are explained with enough supporting references to enable the interested reader to find answers to those "why" questions. Short illustrative case histories are used to provide context for the discussions of care and related procedures.

As an illustration, the chapter on personal hygiene begins with a statement of learning outcomes. There is an explanation of the importance of personal hygiene and how illness can disrupt the normal routines of self-care and create new hygiene problems. A short case history is then used to introduce the discussion of a series of hygiene related nursing problems. The problems are analysed and solutions discussed and explained. A lively style is maintained by the inclusion of a series of practical tips, which are variously informative, stimulating and reassuring. For example, toothbrushes are now the preferred implements for cleaning the mouths and teeth of people who cannot clean their own and bits of cotton wool on sticks are consigned to the disreputable past. But why did we do it that way? Perhaps it was out of fear that patients, particularly unconscious patients, might inhale toothpaste and water. The tip dealing with this problem is reassuring – use a toothbrush but have suction apparatus handy to deal with excess fluid – do it, it is OK. Obvious perhaps, but an example of the authors' practical approach to their subject.

I think this book should be required reading for students on the Common Foundation Programme

and Adult Branch of pre-registration courses. It would also be useful for newly qualified nurses. Its main limitation is the obvious one that it describes practices that will change as time passes. Although its focus on fundamental nursing skills means that some of its recommendations will be slow to change the development of new equipment or new research findings will affect others. I hope that the authors and publisher are committed to maintaining a stream of updated editions for the rest of the century!

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CONFERENCE REPORT:
11th Annual Public Health Forum, UK Public Health Association
Cardiff 18-20 March 2003

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Sandra Furmston, Head, Health Advisory Service, Middlesex University

The Forum was attended by nearly 1000 delegates from the UK and a few from other countries. The venue was the International Arena, very central to the lively and fast-growing city of Cardiff. A reception was held at the City Hall amongst Victorian depictions of Welsh heroes and the conference dinner was at the historic Coal Exchange in the newly revived Cardiff Bay area. Both social occasions were well supported by traditional Welsh music, dance and song.

Geof Rayner, Chair of UKPHA, reminded delegates of the importance of communications, partnerships and a politically effective strategy. He went on to say that health determinants are constantly changing and the public health sector needs the capacity to deal with them.

Building Public Health capacity was a central theme throughout, with many sessions addressing the issue of competency in public health practice. Some professionals will be specialists, some will be in jobs which require some public health practice and the wider community will be individuals as members of the public or in partnership organisations working towards health improvement. The voluntary register for public health specialists will be launched in May 2003, multi-disciplinary but at a high level of competence, people wishing to register will do so through portfolio presentation of the ten key competencies. Once the register is fully operational, professionals applying for accreditation will have to undergo training and pass a series of stringent examinations. Further development of practice standards, also applicable to non-specialists in the field, will then follow on, to be finalised in November 2003. Details can be found at http://www.skillsforhealth.org.uk

Hazel Blears, Minister for Public Health, referred to public health as the key to the restructured National Health Service. She went on to describe the current organisational change as 'shifting the balance of power from Whitehall to the front line', seeing public health professionals as central to the process.

The conference had in all, 70 concurrent sessions and 69 poster presentations. In addition there was a professional exhibition which yielded even more information about current strategies across the UK from Government and non-governmental bodies as well as commercial organisations.

We presented a poster showing the public health role of the Health Promoting University initiative at Middlesex, in creating University Community Partnerships for Health. Our poster showed the range of partner organisations (such as Primary Care Trusts, Local Authorities, Colleges and Voluntary Organisations) and the wide opportunities for partnership in community health improvement.

Health Promoting Universities are a Settings-based initiative supported by the World Health Organisation and in the UK by the Health Development Agency for England (http://www.who.dk/document/e60163.pdf). Community Participation is a key element of the Settings approach in public health and health promotion. The World Health Organisation sees universities as having the prestige and influence to increase their collaboration with relevant organisations such as local government, health professionals and communities in order to improve health (World Health Assembly Resolution WHA37.31 1984, Geneva, WHO). The Arizona Charter of 1999 calls upon universities to engage in addressing the health of the disadvantaged

(http://www.unisol.arizona.edu). Middlesex University's mission statement includes working towards a Community Engagement Culture, which emphasises developing healthy living, good citizenship and creativity. Our Health Promoting University at Middlesex has been involved in the development and evaluation of community health promotion, given health talks to community groups, participated in local festivals by setting up health stalls, invited local and national health charities into our health fairs and the University holds public events at which health promotion often features.

Throughout the conference there was a steady stream of people showing interest, and a number of good contacts were made for future networking. A few of the concurrent sessions also focussed on the public health role of universities and we were able to discuss aspects of the way forward.

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CONFERENCE REPORT:
Royal College of Nursing Annual International Nursing Research Conference
10th-12th April 2003 UMIST, Manchester

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This year's annual RCN International Nursing Research Conference was held at UMIST and was attended by 470 delegates from over 14 countries with nurses from United States, Australia, Belgium Spain and Canada presenting papers and posters. Unfortunately contributors from Hong Kong were prevented from attending due to the travelling constraints imposed due the SARS virus.

The conference was opened by opened by Professor Claire Hale, Chair of the RCN Research Society and Dr Beverly Malone General Secretary of the Royal College of Nursing made the first keynote presentation. Given the current focus on research and development in nursing her vision for nurses being at the forefront of research, leadership and practice development in healthcare, was not unsurprising if not somewhat daunting. However, these themes were reiterated in the symposia and workshops that were available throughout the three days. Delegates were able to participate in sessions addressing issues such as "Crossing boundaries: Opportunities and challenges of NHS and academic partnerships in developing nursing research" and "Research governance: A bureaucratic nightmare or a driver for democratic change?".

Evidence of the reality of effective collaboration between NHS Trusts and the Universities was apparent in many of the papers presented in the concurrent sessions. Given the diversity of specialities and contexts of nursing, the organisation of the concurrent sessions was imaginative. Delegates were able to select sessions that were either devoted to particular aspects of clinical practice, or for those wishing to learn more about the practical application of specific methodologies they could focus on a series of presentations by various researchers.

All of this could seem quite daunting for nurses in the early stages of their research career. However the RCN does identify the importance of support. One specific fringe event was organised for novice researchers. The RCN PhD student network also hosted a fringe event, discussing issues of quality in doctoral work and how students can best be supported.

Kate Ambrose and myself attended the conference this year as members of Mark Newman's ESRC funded project Evaluating the Effectiveness of Problem based learning. Kate presented the results of the aspects of his study related to a randomised field trial. We both contributed to the ensuing discussion focusing on "lived experience" of being PBL teachers. The session was very well received. In comparing Mark's work with that of other researchers with similar interests it would appear that he is making a significant contribution to the construction of knowledge in this area.

The opportunity to spend some time at this conference was very rewarding, not only form the networking opportunities provided, but to experience the range of research interests and methods being utilised by nurses working in extremely diverse settings. I also hope that this report will motivate those of us within nursing, midwifery and primary care to submit abstracts for next year's conference in Cambridge.

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