

APPLICATIONS AND EXAMPLES OF RESEARCH METHODS IN PSYCHOLOGY

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Randomised Controlled Clinical Trials: An Example with an Anti-Depressant

INTRODUCTION

Any therapy or treatment needs to be assessed for its effectiveness or efficacy. The way to do this experimentally is to compare a group receiving the treatment or therapy with a group that does not. It would be expected that the former group shows a greater improvement over a set period of time.

Hill (1955) defined a clinical trial as "a carefully and ethically designed experiment with the aim of answering some precisely framed question".

However, there are a number of quasi-experimental variations of the clinical trial (1).

For a clinical trial to be carefully and ethical designed, there are a number of general problems to address. Particularly when aiming to design the "randomly controlled trial" (RCT), which is seen as the best type of clinical trial.

The general problems with clinical trials are:

i) The appropriate measurement of baseline and improvement.

It is necessary to use a measure that can be compared before and after the trial. In most cases today, self-reported questionnaires or psychometric tests are used.

ii) To control for equality in symptoms among the conditions.

Strict inclusion and exclusion criteria are used to try to equalise the level of the disorder among the different conditions.

iii) To overcome the knowledge of who is in the control or placebo group by the researchers or the participants.

This problem is addressed by the use of "blinding". In an "open label" trial, both researchers and participants know which group they belong to.

With "blind-at-randomisation", participants are divided into the conditions with no prior knowledge of

the condition, but they may soon learn as the trial develops. For example, the presence of side effects with the drug condition, and not with the placebo condition.

"Single-blind" design is where the participants cannot tell which condition, but the researchers know.

But, best of all, is "double-blind" design, where neither the researcher nor the participants know which condition is which (Cohen and Posner 1995).

iv) The ethics of denying treatment in the control or placebo group.

One traditional method used here is to make the control group those on a waiting list for treatment. Alternatively, gain informed consent for the participants: making them fully aware that they may be in the placebo or control group when randomised.

v) Participants dropping out during the clinical trial.

Johnson (1992) notes the reasons and points for drop-outs:

a) At baseline stage before randomisation;

b) Discovered later to have another disorder not being studied;

c) Randomised to one group but given wrong treatment;

d) Side effects of treatment leads to dose reduced or stopped;

e) Leaves during trial or defaults on treatment.

To some degree, the problem of drop-out is hard to stop. The simplest answer is to start with a large number of participants.

PERAHIA ET AL (2006) STUDY

Aims

Duloxetine (SNRI anti-depressant (2)) "was evaluated with regard to its efficacy, safety and tolerability in the prevention of relapse of MDD (major depressive disorder)" (p346).

Participants

All participants (patients) were at least eighteen years old, and met the criteria for "major depressive disorder without psychotic features" in DSM-IV (APA 1994). Exclusion included having a mental disorder other than major depressive disorder, having treatment-resistant depression, being a serious suicidal risk, and having a serious medical illness.

The severity of depression was rated by a score of eighteen or more on the Hamilton Rating Scale for Depression (HRSD) (Hamilton 1960) ⁽³⁾, and a score of four or more on the Clinical Global Impression - Severity (CGI-S) scale (Guy 1976).

The 681 participants initially screened were reduced to 533 who met the inclusion criteria. The study took place in France, Italy, Spain, and the USA, and all participants were outpatients.

Study Design

The study involved four phases, and was "a randomised active-treatment lead-in double-blind placebo-controlled multi-centre parallel-group study" ⁽⁴⁾.

1. Acute phase

All participants were given 60mg of duloxetine daily for twelve weeks, and both the patients and doctors knew what was being taken. This is an "open-label" study.

255 participants left the study by the end of this phase for reasons including patient's choice (n = 62), death (n = 1), or protocol violation (n = 27).

2. Continuation phase

Because the study was interested in prevention of relapse of major depressive disorder ⁽⁵⁾, only 278 participants (52% of the original sample), who were classed as no longer suffering from major depressive disorder, were included here. This was measured by a score of nine or less on the HRSD and two or less on the CGI-S scale.

The participants were randomised to continue duloxetine for twenty-six more weeks (n = 136) or a placebo (n = 142). The study was looking for the re-emergence of the symptoms of depression at any time over the twenty-six weeks (scored as twelve or more on the HRSD).

Forty-six participants completed the placebo group without a relapse and seventy-four in the duloxetine

group. Thirty-three participants in the duloxetine group discontinued and thirty-seven in the placebo group.

3. Rescue phase

Any participants who relapsed had the option of a double daily dose of duloxetine (twenty-nine from the duloxetine group, of which twenty-four completed the study; fifty-eight from the placebo group and forty-five completed).

4. Follow-up phase

No tablets were given to either group and data were collected after one more week. The study was completed by seventy-four participants in the duloxetine group and forty-seven in the placebo group (ie: none of them participated in the rescue phase).

A number of measures of efficacy were used including Quality of Life in Depression Scale (QLDS) (McKenna and Hunt 1992).

Main Findings

Those patients who received duloxetine had significantly longer time to relapse than the placebo group ($p = 0.004$), and significantly fewer relapsed ($p = 0.05$).

EVALUATION OF PERAHIA ET AL STUDY

A number of general problems with clinical trials were mentioned earlier. Here is how this study dealt with them.

i) Appropriate measures

Use of specific scores on HRSD and CGI-S scale to define major depressive disorder and recovery. These two psychometric measures are commonly used in psychiatry and clinical psychology. They are not perfect as psychiatrists or patients rate the answers to questions. There is always room for subjectivity.

ii) Inclusion and exclusion criteria

Strict criteria were used for the study (table 1).

INCLUSION CRITERIA	EXCLUSION CRITERIA
- At least 18 years old	- Having mental disorder other than major depressive disorder
- DSM-IV diagnosis of "major depressive disorder without psychotic features"	- Primary diagnosis of anxiety disorders in previous one year
- moderate depression and improvement (based on eg: HRSD score)	- Treatment-resistant depression
- At least one previous episode of major depressive disorder before current one	- Serious suicidal risk
	- Serious medical illness

Table 1 - Inclusion and exclusion criteria for the study.

iii) Use of double-blinding

In other words, neither the participants nor the researchers knew who was in which group, and the researchers still did not know in the rescue phase. Though, then, the patients knew they were receiving duloxetine.

However, the presence of side effects would give the participants a clue to which group they were in. The authors claimed that there were "no statistically significant differences in the rate of adverse event reported" between the two groups. During the acute phase of the study, 36% of adverse events reported were nausea, and this was the most common.

iv) Ethics

The study was approved beforehand at each site by an ethics review board. The participants gave written informed consent before the study started, and were aware that they could be in the placebo group (which did seem to produce anxiety among a number of participants at the beginning of the continuation phase of the study).

The use of a rescue phase in the study was available to help participants who suffered badly with a relapse of depression. Participants were also seen on nine occasions during the twenty-six weeks of the continuation phase of the study.

v) Drop-outs

Table 2 gives the numbers of participants who dropped out and for what reasons. The total drop-out was 343 people (64.4% of those who began the acute phase of the study).

	ACUTE	CONTINUATION PHASE		RESCUE PHASE	
	PHASE	DULOX*	PLACEBO	DULOX*	PLACEBO
Patient decision (eg: no longer willing to be part of study)	64	11	15	1	7
Adverse event (ie: unpleasant side effect or health risk)	60	5	5	-	-
Protocol randomisation criteria not met (patient not truly randomised to duloxetine or placebo group)	52	-	-	-	-
Lost to follow-up (eg: moved house and did not give new address)	43	6	7	1	2
Protocol violation (eg: changed diagnosis during study)	27	10	7	2	2
Lack of efficacy (eg: drug did not seem to be working)	10	1	3	1	2
Death (from reasons other than study)	1	-	-	-	-
TOTAL	255	33	37	5	13

(* = duloxetine)

(After Perahia et al 2006)

Table 2 - Reasons for and number of drop-outs from the study.

Overall, this study is seen as a good quality clinical trial with many strengths, and inevitably some weaknesses (table 3).

STRENGTHS

1. Larger sample size than many comparable studies (190 participants completed the study including those in the rescue phase) * (6)
2. Double-blinded * (7)
3. Similarity of groups - eg: all outpatients (8)
4. Clear inclusion and exclusion criteria (table 1)
5. Length of whole study reasonably long for clinical trials (39 weeks in total)
6. Multiple measure of symptoms and efficacy used *
7. All participants screened using Mini International Neuropsychiatric Interview (MINI) (Sheehan et al 1998) (9)
8. "(T)he similarity of the acute phase to clinical practice by virtue of the use of open-label treatment" (p352) *
9. Use of rescue phase in study (but entry was at doctor or

psychiatrist's discretion)

10. "(E)valuation of efficacy of double-dosing as a strategy for patients who experienced relapse" (p352) *

LIMITATIONS

1. Exclusion and inclusion criteria may mean that sample not representative of clinical population (*). The exclusion of treatment-resistant depression and high suicidal risk can be accused of "cherry-picking" the best participants
2. Problems of standardising procedures across many centres and countries, particularly where different languages used (10)
3. Frequency of visits and assessment by doctors or psychiatrists not typical of clinical practice *
4. Use of psychometric tests (11)
5. Participants could realise which group because of side effects or "discontinuation-linked adverse events"
6. Did not compare duloxetine to other anti-depressants *
7. Including those in rescue phase in the final data (as they received a double dose of duloxetine) is confounding variable to simply comparing treatment versus no treatment
8. All nine authors of the study are directly or indirectly employed by the manufacturers of duloxetine, Eli Lilly (12)

(* = proposed by Perahia et al themselves)

Table 3 - Strengths and limitations of the Perahia et al study.

FOOTNOTES

1. Quasi-experimental variations of clinical trials include post-test control group design which uses two groups (treatment/no treatment), but has no baseline measures before the treatment began.
2. SNRI = serotonin and noradrenaline uptake inhibitor. The upshot is that more of these two neurotransmitters are available in the brain.
3. HRSD measures the severity of depression in an unstructured interview with 21 items (or 17 as used in this version).
4. Multi-centre trials have several groups of treatment and no treatment/placebo at different centres (figure 1). For example, different hospitals or GPs caseloads and different countries. This is an experimental design, and can be classed as a randomised controlled trial (RCT).

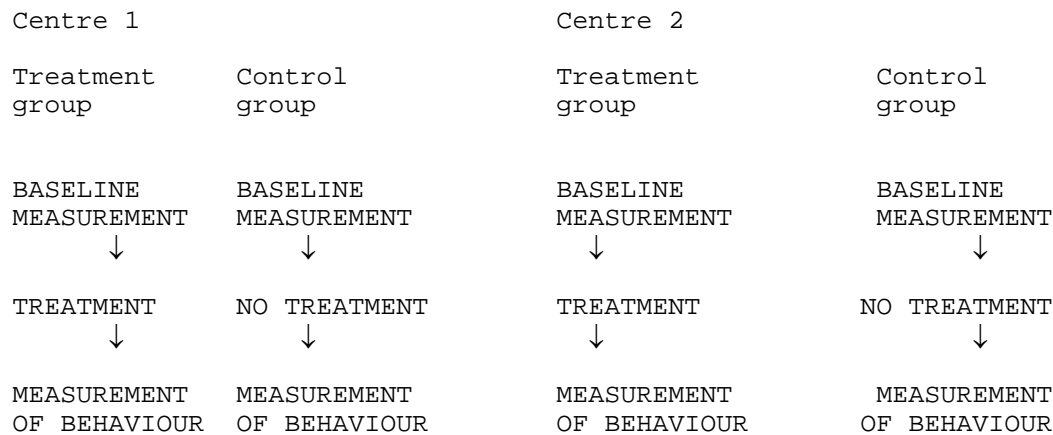


Figure 1 - Multicentre trial.

5. The World Health Organisation (1989) recommended continuation with anti-depressants for nine to twelve months even if the symptoms of depression appear to have gone, in order to avoid relapse.

6. Original screening of 681 participants - 72.1% drop-out/27.9% completed study; 533 participants began acute phase - 35.6% completed the study/64.4% drop-out.

7. The authors noted a general initial increase in symptoms for all participants at the beginning of the continuation phase. This was due possibly to anxiety about the 50% chance of being randomly allocated to the placebo group. However, the authors said, "investigator bias during the evaluation of patients might also be implicated in this observation, and it should be noted that the success of blinding for patients and assessors were not evaluated" (p351).

8. Table 4 lists the characteristics of the two groups in the continuation phase of the study.

	DULOXETINE	PLACEBO
Female (%)	67.6	77.5
Male (%)	32.4	22.5
Caucasian (%)	94.1	93.0
Mean age (years)	45.7	44.8
Mean HRSD score at baseline	4.9	4.6
Mean CGI-S scale score at baseline	1.4	1.4

(After Perahia et al 2006)

Table 4 - Similar characteristics of two groups of participants.

9. The bedrock of psychiatry is the clinical or diagnostic interview. Based on a combination of structured and unstructured questions, the psychiatrist builds up the information for diagnosis. Table 5 lists the advantage and disadvantages of this type of interview.

ADVANTAGE	DISADVANTAGES
- allows individual assessment of patient	- limited for unresponsive, overactive or confused patients
	- patients may present selves in better light ("prestige bias")
	- bias in diagnosis by psychiatrist; eg: influenced by first impressions
	- different responses given to different interviewers

Table 5 - Main advantage and disadvantages of clinical or diagnostic interviews.

10. Two authors based in Spain, two in England, and five in the USA. No details given of who carried out the study in France and Italy. It has to be assumed that local doctors or psychiatrists were used. There is also no detail of how many participants came from each country.

11. It is common practice now in psychiatry to use psychometric tests as a means of assessing the individual or as an outcome measure in studies of the efficacy of treatment. But the tests can have problems in terms of the question design and honesty of answers and scoring.

12. Moncrieff (2003) noted that "studies sponsored by drug companies are more likely to find evidence in favour of the sponsor's product than studies that do not have commercial sponsorship".

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Alcohol and Aggression: Researching the Link using Self-Reported Questionnaires - An Example

INTRODUCTION

In the "synthesis model of aggression", Brewer (2003) noted that the general potential for aggression becomes specific and actual because of disinhibiting factors. These are the removal of brakes that normally stop aggression, and one such is alcohol. Alcohol is estimated to be involved in half of violent crimes (eg: Alcohol Concern 2001; Pernanen et al 2002) (1).

Plant et al (2002) summarised the research as following: heavy and "problem" drinking is associated with violence and victimization of violence, especially for males, but most drinking does not result in aggression, and there is ample aggression without alcohol.

The link between alcohol and aggression has a number of aspects:

- i) The amount of alcohol consumed as in "heavy episodic drinking" (Wells et al 2005) or "binge drinking" (Brewer 2004);
- ii) The frequency of drinking alcohol;
- iii) The social context of drinking - eg: competitive games or situations in bars, or having friends who drink heavily.

From a research point of view, it is a question of how to study the relationship between alcohol, and aggression. In lab experiments, it is possible to control the amount of alcohol consumed and the variables that lead to aggression. But these tend to be small scale studies and not measuring behaviour in "real life".

The easiest way to study alcohol consumption in the "real world", on a larger scale, is through the questionnaire method. This involves asking respondents about their behaviour in a series of questions from an interviewer or on a self-reported questionnaire. But can the answers be trusted?

EXAMPLE OF QUESTIONNAIRE RESEARCH

Wells et al (2005) used data from the US National Longitudinal Survey of Youth (NLSY) which is based on self-reported questionnaires. The researchers took the

information of 738 17-21 year-old drinkers (375 males and 363 females) from three cohorts (1994, 1996, and 1998) using the Young Adult Self Report Booklet (YASRB) (which asked about a whole series of behaviours as well).

The key questions were as follows:

i) Measure of aggression (outcome variable): "how often have you gotten into an argument or fight during or after drinking in the previous twelve months?", and the response choices were "never", "once in a while", "fairly often", or "very often";

ii) "Heavy episodic drinking" (HED): "how many days have you had five or more drinks on the same occasion during the past thirty days?". This was an open-ended question;

iii) Drinking volume: calculated from the number of drinks taken;

iv) Drinking frequency: the frequency of use of alcohol in the previous twelve months with eight response options from "one-two days in past twelve months" to "daily";

v) Usual drinking location: response choices of "at home, in somebody's car, dances, at parties, at friends' homes, in bars, at relatives' homes, or other" (p936);

vi) Typical drinking companions: response choices of "alone, friends, a date, parents, brother or sister, other relative, other adults, or other" (p936);

vii) Peer drinking: "how many people of your age that you hang out with drink alcohol at least sometimes?".

The results showed that alcohol consumption was "significantly and positively associated with fights after drinking" (p937) (table 1).

Table 2 compares the gender differences between alcohol consumption and fights.

Many aspects of alcohol consumption were linked to aggression, but multivariate analysis did not find the factors as causal. For example, drinking frequency, but not HED, was significant for aggression.

EVALUATION OF METHODOLOGY

The use of questionnaires in research is by far the

		NO FIGHTS	FIGHTS	
Number of individuals		484	254	
	Male (%)	58.6	41.5	
	Female (%)	62.8	37.2	
HED	Yes (%)	43.3	56.7	0.0001
	No (%)	69.0	31.0	
Drinking frequency (mode)	"every other month"		"1-2 times a month"	0.0001
Total number of drinks in past 30 days (mean)	11.3		34.0	0.0001
Location	private homes 62.6%		public places 55.5%	0.01
Drinking companions	family/other adults (79.3%)		alone/ date/ other (52.1%)	0.0001

(After Wells et al 2005)

Table 1 - Drinking variables and fighting.

		MALE	FEMALE
HED	Yes (%)	52.3	62.6
	No (%)	35.5	26.4
Total number of drinks in past 30 days (mean)		42.5	23.2

(After Wells et al 2005)

Table 2 - Gender differences in alcohol consumption and fighting.

easiest way to gain a large amount of data, but as a method it faces a key problem here - the trustworthiness of the replies.

Respondents may give false information to the researcher in a number of ways: as a direct lie, through memory errors, or from misunderstanding the question.

1. Direct lie

The respondent knowingly gives the researcher the wrong information, maybe to maintain their impression of themselves, or to hide a crime. There is no way of checking the answers to the questions about how much or how often alcohol is drunk, or the number of fights had.

Some individuals may over-inflate their alcohol consumption to give the impression of a "bit of a lad" or a "good-time girl", or under-report the number for health reasons or gender aspects. For example, the response option of "daily" to the question about frequency of use of alcohol could make the respondent feel like an alcoholic if chosen (which is socially unacceptable for most people). This is sometimes called the "social desirability bias" (Coolican 1994).

While fighting can end up as a criminal offence if caught, and respondents may not want to admit to lots of fights. Other respondents over-report fights to show how "tough" they are.

2. Memory error

Questions involving time periods in the past can produce mistakes in recalled information. For example, the question on HED uses the "past thirty days", and the one on drinking frequency, the "previous twelve months". Both are difficult time periods to gain accurate answers from memory. Some respondents will drink (and fight) so regularly that underestimates are given. A respondent who has one fight in a year, and that was an exceptional event, is more likely to recall accurately that fight. But will they tell the truth about such an event that is possibly shameful for them?

3. Misunderstanding the question

It may seem that the questions used by Wells et al are not difficult to understand, but respondents may have their own definitions of fighting and of drinking. For example, a fight is not a fight, for some, unless blood is drawn, or an individual ends up in the hospital, or the police make arrests. Otherwise it is a "bit of a laff" and not a fight.

While some individuals may not see certain drinks as alcohol; eg: "designer drinks" like "Vodka Kick" (easy-to-drink high alcohol-by-volume). Measuring HED is difficult for researchers let alone ordinary drinkers when no clear definition was used. In other studies, terms like "binge drinking" or "risky single occasion drinking" were used with varying amounts of alcohol applied (Brewer 2004).

Because of the problems of self-reported questionnaires here, alternative methods could be tried instead or as well as. For example, Graham and Wells (2001) used observations of aggression in bars to supplement their thirty-four interviews.

Student observers noted 117 incidents of aggression over ninety-three nights (between 00.00 and 02.30) in Ontario, Canada. The majority of offenders were male (74%), and the most common apparent triggers for aggression were "trouble-making and offensive behaviour" (26.0% of cases) followed by "interpersonal and relationship issues" (14.2%). But the observers were not able to categorise the triggers in 38.5% of cases.

FOOTNOTE

1. The link between alcohol and crime generally occurs in different ways (Purser 1995 quoted in Alcohol Concern 2001):

- a) Offences which specifically mention alcohol- eg: drinking and driving;
- b) Offences against the Licensing Law - eg: serving under-aged drinkers;
- c) Offences committed while under the disinhibiting effect of alcohol - eg: alcohol as "Dutch courage" in burglary;
- d) Offences resulting from an alcohol problem - eg: stealing money to buy alcohol;
- e) Offences where alcohol used as excuse - eg: "date rape".

A fuller exploration of the relationship between alcohol and crime can be found in McMurrin (2003).

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Twin Studies: Researching Genes and Environment

Twin studies concentrate on identical (monozygotic; MZ) and non-identical (dizygotic; DZ) twins. MZ twins have the same genetic make-up. The ideal experiment would be to separate the MZ twins at birth, and raise them in different environments. Then to see if the twins showed the same behaviour, which must then be due to genes. This is the "MZ apart" twin study.

A concordance rate is calculated, and if it was 100%, it would show that if one twin had the behaviour, then the other twin always did as well.

But, in reality, twin studies depend on volunteers: they may have been separated at any age, and the environments may not be that different. Bronfenbrenner (1986) reported correlation rates of 0.86 for particular behaviours when the "MZ apart" were reared in similar environments, and 0.26 when in different environments. Because of the many confounding variables, twin studies are thus, technically, quasi-experimental designs (1).

"MZ apart" twin studies would be "true" experiments if the following controls were possible: separation of the twins at birth, and each twin raised in a completely different environment (figure 1). There are ethical problems with such a study, and this is why volunteers are used who have already been separated by circumstances (ie: opportunism).

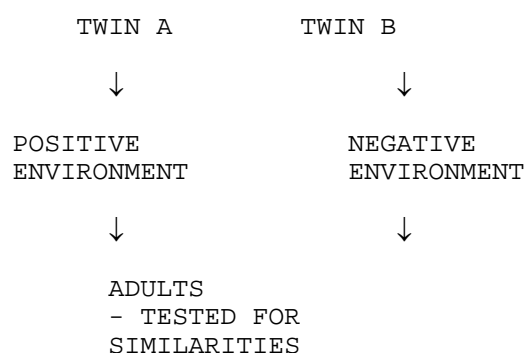


Figure 1 - Criteria for "true" experiment with "MZ apart" twin studies.

The true separation of the twins is the biggest problem for "MZ apart" studies. For example, Jackson (1960) reviewing the studies, available at that time, of "MZ apart" for schizophrenia could only find two pairs of twins who were genuinely reared apart. These two pairs

produced a concordance rate of 100%.

While Gottesman and Shields (1972) reported eight such studies giving seventeen pairs genuinely reared apart; the concordance rate for those twins was 62%. But the age of separation varied from "soon after birth" to "between 3-8 years old". In some cases, the twins were reunited.

Because of this problem and thus the small number of MZ twins raised separately, most studies compare the concordance rates of MZ twins reared together ("MZ together") with DZ twins reared in the same environment ("DZ together").

Gottesman and Shields (1972) made two predictions about heritability and "MZ together" and "DZ together" studies:

a) If genetic differences are of no importance the concordance rates in MZ and DZ co-twins should be the same;

b) If genes are important, MZ co-twins should be affected more often than DZ co-twins.

Bouchard and McGue (1981) reviewed 111 studies on intelligence between family members, and calculated the concordance rates in table 1. Scarr (1997) expanded the work.

RELATIONSHIP	NUMBER OF PAIRS	CONCORDANCE RATE
MZ together	4672	0.86
apart	65 (158)	0.72 (0.65)
DZ together	5546 (8600)	0.60 (0.55)
apart	(112)	(0.35)
Siblings together	26 473	0.47
apart	203	0.24

Figures in brackets = Scarr (1997)

Table 1 - Concordance rates for intelligence from Bouchard and McGue (1981).

However, despite all the difficulties, twin studies are still useful (table 2). In fact, there are growing in popularity in both medicine and psychology as shown by the existence of twenty major twin registers worldwide (Ohlson 2002).

STRENGTHS

- show genetic contribution to behaviour; ie: control environmental variables
- more ethical than equivalent experiment
- study over long period
- findings of genetic causes removes blame from parents for child's problems
- allows more detailed study of genetics than with siblings and other family members
- twins raised in same environment do have different experiences (non-shared environment; Dunn and Plomin 1990)

WEAKNESSES

- many studies based on retrospective data
- small samples usually
- different definitions of behaviour used in different studies
- twins share same environment in womb, so cannot completely remove environmental influences from "MZ apart" studies
- desire to explain social inequalities down to genes (Ohlson 2002)
- whether trait is nature or nurture is meaningless because it is combination of both
- downplay role of parents who treat identical twins as same
- environment assumed to be equal challenged by non-shared environment (Sham 1996)
- what is actually inherited because genes code for physical aspects of the brain and body which leads to behaviour, but genes do not code for behaviour

Table 2 - Main strengths and weaknesses of twin studies.

EXAMPLE OF TWIN STUDIES

Gottesman and Shields (1972) is a classic example of the use of the twin study method with schizophrenia.

The researchers found 55 patients diagnosed between 1948-64, who were twins and would co-operate in the study. All of these co-twins were attending a London psychiatric clinic and were diagnosed as schizophrenic.

Twenty-four of the patients were a MZ twin, and the others a DZ twin. The study was interested in the concordance rate for schizophrenia in the twins. This study attempted to interview as many of the twins as possible. Thus diagnosis was done after face-to-face interview, which is not always the case in twin and adoption studies.

Using a criteria of "diagnosed with schizophrenia and hospitalised", the concordance rates were 42% for MZ twins and 9% for DZ twins. This difference is assumed to

be due to the role of genetics in the disorder.

However different definitions produced different concordance rates: for example, "hospitalised with psychotic illness" (not schizophrenia) produced a rate of 54% for MZ twins and 18% for DZ twins. While a definition of "abnormal" gave rates of 79% and 45% respectively (Davison and Neale 1996).

TWIN STUDIES TODAY

Twin studies are used for three reasons today:

i) To establish the genetic overlap between different syndromes.

Kendler et al (1987) found evidence of a "genetic distress" that is a combination of both anxiety and depression. The statistical techniques used produced a common genetic origin (technically a 30% loading) for these two disorders among over 3000 pairs of twins.

While Kendler et al (1995), using the Virginia Twin Register of female pairs (1033 pairs), have found shared genetic factors for major depressive disorder and generalised anxiety disorder, and for phobia, panic disorder and bulimia.

ii) To show the continuity of genetic factors at different stages of an illness.

Kendler et al (1993a) again using the Virginia Twin Register on two separate occasions, one year apart, found that genes accounted for approximately 50% of liability for major depressive disorder on both occasions.

iii) To find the relationship between genetic and mediating or environment factors in the development of an illness.

It is possible to build models to explain the basis of mental disorders. Kendler et al (1993b) studied the development of major depressive disorder and adverse life events over one year with the same sample as Kendler et al (1993a). From their statistical analysis, the researchers produced a three layer model (which accounted for 50% of variance) of the causes of major depressive disorder:

- Distal layer: genetics; parental warmth and childhood parental loss.

- Intermediate layer: neuroticism; lifetime trauma; past depression.
- Proximal layer: social support; recent difficulties; recent stressful life events.

Using twin studies in this way has led to attempts to produce heritability estimates for mental disorders - eg: schizophrenia 68% (Kendler 1983); bipolar disorder 59% (Bertelsen et al 1977) (2).

All of the uses of twin studies today are combined with statistical techniques developed in biometrics. For example, structured equation modelling (SEM), which gives a pattern of predicted correlations that are compared to the findings (eg: Clifford et al 1984).

FOOTNOTES

1. Cook and Campbell (1979) defined quasi-experiments as "experiments that have treatments, outcome measures, and experimental units, but do not use random assignment to create the comparisons from which treatment-caused change is inferred".

Quasi-experiments do not have the randomisation of participants or the clear control of variables found in "true" experiments. Technically, the "true" experiment is the only method by which causation can be established.

2. A common way of estimating heritability is Holzinger's Index (Nurnberger and Berrettini 1998):

$$\text{Heritability} = \frac{\% \text{ MZ concordance} - \% \text{ DZ concordance}}{100 - \% \text{ DZ concordance}}$$

Thus using Bouchard and McGue's (1981) figures for MZ of 0.86 and 0.60 for DZ gives a heritability of intelligence of 65% (or 0.65).

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Studies of Monkeys and Apes: Laboratory vs Naturalistic Studies

Monkeys and apes have a long history of being used in psychology, from the laboratory work on attachment and deprivation in rhesus monkeys (eg: Harlow 1959) to the controlled community of rhesus monkeys on the Caribbean island of Cayo Santiago (Rawlins 1979), and insight problem-solving in chimpanzees (Kohler 1925).

One major use has been in order to establish the evolutionary basis of behaviour. It is argued that if monkeys and apes show the behaviour seen in humans then that behaviour must have evolutionary benefits.

Research on monkeys and apes is based in two methods
- laboratory experiments and naturalistic studies.

EXPERIMENTS IN THE LABORATORY

The use of monkeys and apes in laboratory experiments has both strengths and weaknesses (table 1), but control of variables tends to be the strongest motivator. It is much easier to study behaviour, like co-operation in controlled situations than in the natural habitat, and variables can be manipulated to establish cause and effect.

ADVANTAGES	DISADVANTAGES
- can be used where humans couldn't	- ethics of use and of inflicting pain and suffering
- greater control of variables	- ignores role of language and culture in human behaviour
- whole process of development can be observed, and several generations studied in relatively short period of time	- flexibility of humans to learn
- similar physiology among mammals	- cognitive processes, like attribution, cannot be studied
	- physiology is different in some ways

Table 1 - Main advantages and disadvantages of laboratory experiments with non-human animals.

Experiments on Animal Cognition

Number-Handling

Put simply, this is very basic mathematical ability. Work in the laboratory with one chimpanzee, Ai (eg: Kawai and Matsuzawa 2000) has shown a basic numerical ability. When numbers were shown on a screen in a random pattern, Ai was able to press the numbers in correct order for 1-2-3 (three items) (over 90% correct), four items (over 95% correct), and five items (around 90% correct) (Hauser 2005). But five numbers in order seemed to be Ai's capacity.

Hauser (2005) argued that this type of research is not completely artificial because chimpanzees in the wild use basic knowledge of numbers to decide when to fight or hide from opponents. Wilson et al (2001) played, over a loudspeaker, the call of a foreign male. When three or more males together heard this call, they called back and prepared for a fight. But with one or two males, they kept silent in response to the loudspeaker. Wrangham and Peterson (1996) reported, from observations of chimpanzee warfare, that three or more to one is "meaningful, representing the minimum number of males necessary to hold and kill an intruder" (Hauser 2005 p60).

Brannon and Terrace (quoted in Motluk 1998), working with rhesus monkeys, have found that they can understand the sequence of numbers up to nine (with 75% accuracy on tests). There is debate as to whether numerical skills can exist without language abilities.

In fact, there is the suggestion that macaque monkeys are better at simple maths than one-year-old human babies (O'Leary 1998). What the simple maths ability shows is that the monkeys are recognising individual objects, grouping them, and tagging them with a value which allows the monkeys to keep track. Other famous examples of counting monkeys include "Sheba" (male chimpanzee) trained by Sarah Boysen (Vine 2000).

Theory of Mind

"Theory of mind" is the term for an individual being able to understand the thinking behind the behaviour of another individual.

A human puts sweets in a container in front of the monkeys, then leaves the room. "Panbanisha" (bonobo chimpanzee) watched bugs substituted for sweets by another human, and knew when the first human re-entered the room, they would expect to find sweets. This is a

commonly used scenario for the "theory of mind"; ie: to take the other's perspective (Heyes 1998).

"Austin" "knows" that "Sherman" is afraid of the dark. The former will make noises at night to scare the latter if "Sherman" is being difficult (Vines 1992). These are chimpanzees.

Povinelli (quoted in Vines 1992) arranged for two humans to deliver a drink to the chimpanzees. One of the humans accidentally spilled it, while the other deliberately poured it away in front of the chimpanzees. The chimpanzees showed a preference for the first person to deliver future drinks. This is the ability to understand intentions.

But Povinelli and Eddy (1996) found that chimpanzees would gesture for food to experimenters who were blindfolded equally as those who were not blindfolded. Povinelli argued that reasoning about another's mental state is unique to humans.

Not everybody agreed. Hare et al (2001) tested the understanding of the other's mind in a competitive situation, which is similar to the wild, with a dominant and a subordinate chimpanzee. The experiment involved three conditions and the availability of bananas to the chimpanzees:

Condition 1 - One banana visible to both the dominant and the subordinate chimpanzee, and another banana only visible to the subordinate. The dominant usually took the first banana, and the subordinate the second;

Condition 2 - Two bananas visible to both chimpanzees, and usually the dominant chimpanzee took both;

Condition 3 - Initially no banana visible, but when the dominant chimpanzee looks away a banana is placed in the sight of the subordinate only. Subordinate chimpanzees with a theory of mind will know that only they can see the banana and so will take it. Subordinates without a theory of mind will assume that the dominant chimpanzee also knew about the banana, and leave it to them. The former is what happened.

Co-operation Experiments

Two group of monkeys have studied mainly in recent experiments on co-operation - capuchin and cotton-top tamarins.

Capuchin monkeys

The basic design of this type of experiment involves two monkeys in separate cages who can only reach the food by working together. In Chalmeau et al (1997), the monkeys had to press two levers simultaneously for the food to fall down tubes into the cages. While, in de Waal and Berger's (2000) version, the monkeys had to simultaneously pull on two iron bars attached to a food tray. In both experiments, the food could not be obtained by a single monkey.

These experiments were performed by two different teams of researchers, and they both found that the monkeys co-operated to gain the food. But the two teams interpreted the results differently.

Chalmeau et al (1) explained the co-operation as due to the chance occurrence of simultaneously pulling the levers. While de Waal and Berger (2) saw the behaviour as definite evidence of co-operation and co-ordination between the two animals. For them, this was similar to co-operative hunting seen in the wild. Noe (2006) was not convinced about this.

The problem is that the behaviour of the animals used in the experiments has to be interpreted. Human participants can be asked to describe their motives in an experiment.

Cotton-top tamarins

Hauser et al (2003) set up an experiment where one member of a pair of monkeys in separate cages could pull a tray with food towards itself only, the other animal only, or for both of them. Using a trained and an untrained monkey, the researchers were interested to see if one monkey would reciprocate the altruism of the other.

Some monkeys were trained always to be altruistic (pull the tray for the other monkey to receive food only) or non-altruistic ("defector") (only pull the tray when they themselves received food only). These were classed as stooges. How would the untrained monkey respond to the stooge when they had control of the tray? The untrained monkeys were more likely to pull the tray when paired with an altruistic than a non-altruistic stooge.

A number of variations in the basic experiment were performed, but, in all cases, the behaviour of the monkeys has to be assumed. It was felt by the researchers that the behaviour was not due to simple reinforcement. But is it possible to establish that the behaviour is altruism in the sense of human examples, like blood donation?

Furthermore, reciprocal altruism is not seen as that common in animals (Fehr and Fischbacher 2003).

Chimpanzees

The concern for the welfare of others (ie: non-kin) (known as "other-regarding preferences"; Silk et al 2005) is not evident in chimpanzees, even with familiar individuals, and at no cost to the self, despite the fact that chimpanzees in the wild do collective activities like hunting.

Silk et al (2005) had expected chimpanzees to show "other-regarding preferences". Using two groups of captive chimpanzees (in Texas and Louisiana), she and her colleagues offered individual chimpanzees the choice of food for themselves (known as 1/0) or food for themselves and another chimpanzee at the same time (known as 1/1). The choice of 1/1 did not vary whether another chimpanzee was present or not suggesting that the animals were not concerned with others (table 2).

So there is the problem of different results using different species.

Table 3 lists the problems with these types of experiments.

CHIMPANZEES:	LOUISIANA	TEXAS
Choice of 1/1 when alone	56	48
Choice of 1/1 when another chimpanzee present	58	48

Table 2 - Average percentage choices by chimpanzees.

1. Behaviour of animals has to be interpreted by researchers
2. Use of artificial tasks
3. Problems of training monkeys for experiment
4. Whether monkeys perceive themselves as partners in the experiment (Noe 2006)
5. Problems of generalising results to human co-operative and altruistic behaviour
6. Different results from using different species of monkeys
7. General weaknesses of laboratory experiments

Table 3 - Problems with laboratory experiments on co-operation between monkeys and apes.

The use of chimpanzees in any experiments is criticised by Peter Singer of the Great Ape Project: "The fact that they clearly have some self-awareness shows that we should treat them differently... The case for granting them some basic rights is a stronger one than

might be made for mice and other animals" (quoted in Check 2005).

In September 2005, the complete sequence of the chimpanzee genome was published (The Chimpanzee Sequencing and Analysis Consortium 2005), and, for Gagneux et al (2005), this raised the concern that it was "likely to motivate many further studies of ape biology and physiology". The authors argued for very careful controls on the use of chimpanzees in scientific research generally.

While VandeBerg et al (2005) believed that "Research with chimpanzees is essential for reducing risks to human research subjects, and ultimately to human patients" (p30). Again these authors were talking about scientific research generally.

Brewer (2003) argued that, within psychology, attitudes against animal experiments are dominant among young people coming through graduate courses. For example, among psychology PhD students in the US in the mid-1990s, only 20% strongly supported animal research (compared to 50% pre-1970) (Plous 1996).

NATURALISTIC STUDIES AND CULTURE IN CHIMPANZEES

Because of the concerns about using monkeys and apes in laboratory experiments, one alternative is to study them in their natural habitat without interference. Table 4 lists the advantages and disadvantages of such studies.

ADVANTAGES	DISADVANTAGES
- natural environment observed	- lack of control or causality
- where experiment not appropriate	- difficulties of measurement
- means of identifying new problems/hypotheses	- usually relatively small sample
- where fuller picture of behaviour needed than in experiments	- some aspects of behaviour not observable
- describe chronology of behaviour	- important behaviour may be missed
	- observer bias
	- difficult to replicate
	- reactivity of participants when know being watched

Table 4 - Advantages and disadvantages of naturalistic observation studies.

Traditionally the existence of culture is seen as distinction between humans and non-humans. The dominance hierarchies of certain monkeys, like vervets, is quite sophisticated, but it is not the same as human culture.

Yet there is evidence of "enculturation" among apes reared by humans, particularly in language teaching studies. For example, "Kansi" (bonobo chimpanzee) was never directly taught "symbol language", but picked it up from the teaching of "Matata" (adopted mother) (Savage-Rumbaugh 1991). Similarly, "Washoe" (chimpanzee) was seen to teach her infant American Sign Language (ASL) (Gardner and Gardner 1980). But these are not typical situations.

However, studies have found animals showing social transmission of individual behaviours in their own habitats; eg: sweet potato washing in sea water by macaques at Koshima, Japan (Imanishi 1957). The social or cultural transmission of ideas across generations is used as a key concept of culture by biologists.

Only recently has more detailed evidence of cultural transmission been highlighted among chimpanzees.

Jane Goodall is probably best known for her painstaking observations of chimpanzees in their habitat (3). This research and that of others as part of seven long-term projects have together produced 151 years of chimpanzee observation (Whiten et al 1999).

From these projects has come observations of differences in the behaviour repertoires of chimpanzees that has been called cultural variation (Whiten et al 1999).

Whiten et al (1999) identified thirty-nine different behaviour patterns between the seven sites in Africa (4): Bossu (Guinea), Budongo (Uganda), Gombe (Tanzania), Kibale (Uganda), Mahale (2 separate projects) (Tanzania), and Tai Forest (Ivory Coast) (5) (6).

The differences in behaviours between the sites were classed as culture where it appeared that the behaviour had been learnt by chimpanzees at that particular site. For example, eight behaviour patterns were seen as unique to Tai Forest chimpanzees and three to chimpanzees at Gombe. Table 5 gives some examples of behaviours.

"Each local chimpanzee community has a unique array of specific traditions, representing a 'package' that can be described as its local culture.." (Whiten 2005 p53).

Frans de Waal (2002) argued that these behaviours along with "Machiavellian intelligence" (8), empathy, and looking after non-genetic orphans are signs of culture.

Since Whiten et al (1999) other behaviour patterns have been added. For example, McGrew et al (2001) noted differences in "grooming handclasp" between the two

BEHAVIOUR	EXAMPLES
Cracking nuts	Hit with wood (hammer) against wood (anvil), or stone hammer on wood anvil, or stone hammer on stone anvil
Fishing for insects	Put stick into termite mound and pull out with insects on, wipe stick with hand and place insects in mouth, or put stick directly into mouth (7)
Grooming	Pick off parasite and squash in hand, or squash on skin
Gaining attention	Knock knuckles loudly, or slap branches, or bend branches nosily

Table 5 - Examples of behaviour differences between sites.

projects at Mahale, and between Mahale and Gombe (100 km away), where the behaviour is absent. This is the holding of one hand outstretched while grooming with the other.

A similar project with orangutans has identified nineteen clear behaviour patterns between sites (van Schaik et al 2003).

In terms of evolution, Whiten (2005) proposed:

A working hypothesis is thus that in the ancestors of the great ape clade, there occurred a distinctive step towards reliance on a relatively rich cultural repertoire that incorporates both technological and social elements (p53).

Allsopp and Brewer (2002), talking about modelling of human cognition, pointed out that culture is more complex than just the intergenerational transmission of behaviours. It includes values, beliefs, customs, rules, and regulations. Culture influences all behaviour if a social constructionist or sociological position is taken.

After the observations of different chimpanzee cultures, researchers have tried experiments to see how the chimpanzees learn the cultural repertoire. These include moving a chimpanzee with a particular behaviour (eg: cracking nuts) to another site to see who copies who (eg: Nielsen et al 2005).

This research has led to the main question currently being answered - why is chimpanzee culture so limited, or put another way, why has human culture developed so much more?

CONCLUSIONS

The use of animals in science generally is highly controversial, including, at the extreme, letter bombs sent to researchers (Koenig 1999). In psychology, particularly with experiments which do not cause the animals pain, the response is not so strong. However, it always has to be asked how useful such experiments, like the co-operation ones discussed above, really are to understanding human psychology.

It may be better to follow the recommendations of the "3Rs", proposed originally by William Russell and Rex Burch in 1959 (Langley 2003):

- i) Replacement of animals experiments by other methods;
- ii) Reduction in the numbers of animals used;
- iii) Refinement of experiments to cause less pain and distress.

Organisations, like The Dr.Hadwen Trust for Humane Research (9), are actively involved in funding alternatives to animal research in science (eg: test-tube studies of immune cells rather than in animals).

FOOTNOTES

1. Also Visalberghi et al (2000).
2. Also Mendres and de Waal (2000); de Waal and Davis (2003).
3. Goodall's years of observing Gombe Stream Reserve's Kasakela and Mitumba chimpanzee communities (on the eastern shore of Lake Tanganyika) produced some surprising findings (eg: van Lawick-Goodall 1965; Goodall 1968; van Lawick-Goodall 1974). The first remarkable observation was in 1960 when "David Greybeard" showed evidence of tool-use by using a grass blade to get termites from their nest (Goodall 1964). More disturbingly, warfare and cannibalism were also observed (Goodall 1978).
Similar long-term observations of gorillas were made by Dian Fossey (Fossey 1980).
4. Details of Bossu (Matsuzawa 2002); Budongo (Reynolds 2005); Gombe (Goodall 1986); Mahale (Nishida 1990).
5. Whiten et al (2001) added observations from chimpanzees at Lope (Gabon).
6. Overall known as Collaborative Chimpanzee Cultures

Project (CCCP) (Whiten 2005).

7. Recently, Sanz et al (2004) observed chimpanzees at Goualougo Triangle (Republic of Congo) combining two sticks.

8. A term for "social intelligence", but also the use of theory of mind to benefit the self over others.

9. The Dr.Hadwen Trust for Humane Research, 84A Tilehouse St, Hitchin, Hertfordshire, SG5 2DY, UK.

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Use of Historical Information in Psychology: Crime in Historical Documents

INTRODUCTION

Information about the past can be used in psychology in a number of ways and from a number of sources:

i) Longitudinal studies - showing how behaviour has changed over time.

An ideal longitudinal study will follow the group studied prospectively (ie: from the start of the study), but often it is a method used retrospectively (ie: working backwards). However, the latter use may be dependent on the recall of the participants.

Table 1 compares the advantages and disadvantages of retrospective and prospective longitudinal studies.

ADVANTAGES	DISADVANTAGES
RETROSPECTIVE	
- low cost	- recall accuracy of participants
- quick results	- behaviour may be interpreted based on current view/feelings
- small samples only	
PROSPECTIVE	
- less bias as information recorded before outcome	- high cost: large sample over long period of time
- multiple outcomes studied	- periodic examination of participants may influence outcome

Table 1 - Comparison of retrospective and prospective longitudinal studies.

ii) Therapists and psychiatrists - how events in the individual's past can affect their behaviour now.

Psychoanalysis, for example, is based on the assumption that early childhood experiences influence adult behaviour and personality. Thus psychoanalytic sessions are solely concerned with discovering the past.

But finding out about the individual's past is also a core aspect of the clinical interview used by psychiatrists. This interview is sometimes known as the Present State Examination (PSE) (Wing et al 1974) (table 2).

The interview session(s) contains certain elements (Gelder et al 1996):

a) History-taking - details of the patient (ie: present condition and circumstances). Usually supplemented from other sources, like relatives, later. It includes family history, personal and psychiatric history (including current complaint and history of present disorder), and assessment of the personality.

b) Mental State Examination (MSE) - this part of the interview concentrates on the mental state now.

c) Physical examination - a medical examination may be necessary in some cases.

d) The use of psychometric measures - more structured tests may be appropriate in certain situations.

FOCUS OF CLINICAL INTERVIEW	EXAMPLE
- family history	genetic basis to certain mental disorders, or living with family members with that problem
- childhood problems	Attention Deficit Hyperactivity Disorder (ADHD) often seen in individuals who are diagnosed as Anti-Social Personality Disorder in adulthood
- leisure activities	collecting newspapers and hoarding things with no use could be sign of obsession
- appearance	clothes, make-up, hair, and facial expressions all different between mania and depression
- occupations	series of jobs leaving suddenly could be sign of solitary behaviour or problems with social interactions
- speech	speed and content also different between mania and depression
- attitudes	belief that world is against them and bad things that happen are deliberately caused by others is sign of possible paranoia
- insight	lack of insight about own behaviour is characteristic of psychosis

Table 2 - Examples of how parts of clinical interview can help in diagnosis of mental disorders.

iii) Historical documents.

HISTORICAL DOCUMENTS

Chase (1995) included three groups of data from historical sources:

- i) Memory data sources - eg: autobiography.

EXAMPLE:

In his book, "Anatomy of Depression", Lewis Wolpert (2001a) recounted his experience of suffering serious depression. Wolpert (2001b) concentrated on the stigma of depression, and the consequent self-stigmatisation that makes sufferers ashamed and secretive about their depression.

"I am repeatedly congratulated for being so brave, even courageous, in talking so openly about my depression. I, in fact, am a 'performer', and there is no bravery, but these comments show how others view depression and that it is highly stigmatised" (Wolpert 2001b p222).

Ultimately, Wolpert argued, the shame and stigma can stop individuals with depression coming forward for treatment.

- ii) Representational data sources: including media records, manuscripts and writings, and official data. For example, material from the Mass Observation surveys (archived at the University of Sussex; Garfield 2005) begun after the Second World War could be very useful.

EXAMPLE:

Kay Redfield Jamison (1995) made use of historical sources to show how many creative individuals suffered from manic-depression (bipolar disorder). But, in particular, she concentrated on the music composer, Robert Schumann.

Jamison was able to show a relationship between his moods and the number of pieces of music composed. For example, in 1833, the year of a suicide attempt, Schumann composed two pieces of music. While in 1840, a year of being "hypomanic", he produced twenty-four. There was a similar pattern in 1844 (severely depressed) and 1849 (hyomanic). Other years, the average output was three to five pieces in a year.

EXAMPLE:

Seaborne and Seaborne (2001) found 198 cases of self-killing in the Eyre records (judicial and

administrative inquiry) between 1227-1330. Hanging was most common for men (59 of 135 male self-killings), and this was followed by drowning, and the use of sharp objects.

The same three methods were most popular for women, but many less self-killings (63 in total).

iii) Artefactual data sources (indirect sources)- eg: gravestones as representations of death over time.

Table 3 gives the main advantages and disadvantages of using historical documents.

ADVANTAGES	DISADVANTAGES
- unobtrusive	- necessary material sometimes hard to obtain
- possible to examine trends over long period of time	- reliability and validity of documents
- shows continuity of behaviour over time	- limited sampling only
- shows social context for understanding social construction of behaviour	- interpretation by reader today

Table 3 - Advantages and disadvantages of historical sources.

PRIMARY RESEARCH

The use of newspaper and magazine stories can be helpful to psychologists in understanding behaviour and society at a particular time. Obviously there are limitations including the style, and focus of writing for the audience. However, it is interesting to see how crime was reported, for example, in the past.

The "Essex Countryside" was a magazine reporting topics of interest about the history of Essex. Five stories about criminal events were chosen at random. The aim was to see how useful such material would be to psychologists wanting to understand criminal behaviour and motivation. Table 4 lists the details of the articles.

1. "Murder at Moat Farm"

This article tells of the "self-styled captain, convicted forger, suspected fire-raiser and ungallant woman hunter" Samuel Dougal, who murdered his lover in

AUTHOR/TITLE	CRIME AND DATE	LENGTH (A4 pages)	"ESSEX COUNTRY-SIDE"
D.A.Thomas "Murder at Moat Farm"	murder of young woman in 1899	3/4	Winter 1956-7
G.W.Martin "The tragedy of the Alresford twins"	attempted murder in 1899	1 with original drawing	September 1960
G.Caunt "One of the greatest liars of all time"	John Price and history of lying c1678-1718	3/4	August 1961
J.Copeland "The Coggeshall Gang"	house-breaking gang in 1844-8	1	September 1961
E.McAdam "An Essex villain who went lightly to the scaffold"	Joseph Wilson 1787-1817	1 & 3/4	January 1977

Table 4 - Five articles used from "Essex Countryside" magazine.

1899. Most of the article focuses on the police investigation to find the body of the murdered woman.

There are a number of references to Dougal's scandalous behaviour, both before and after the murder, like his sexual advances towards the maids. He also forged the dead woman's signature on cheques for a while. Leaving aside the social norms for behaviour of the time, a pattern appears of criminal behaviour of various kinds by Dougal. His ability to charm and deceive individuals as well - for example, the "seduction" of a "devoutly religious middle-aged spinster" (the murdered woman) who was persuaded to buy an isolated farm. These are some of the characteristics of the criminal psychopath as portrayed in the Psychopathy Checklist (PCL-R) (Hare 1991).

Table 5 lists the characteristics (out of 20) shown by Dougal in the article.

- | | |
|--------------------------------|--|
| - cunning/manipulative | - parasitic lifestyle |
| - promiscuous sexual behaviour | - many short-term marital relationships (Dougal was married) |
| - criminal versatility | - grandiose sense of self worth |
| - superficial charm | (eg: "self-styled captain") |

Table 5 - Characteristics shown by Dougal from PCL-R.

Obviously there is limited information from the

article to make an accurate diagnosis of psychopathy (or Anti-social Personality Disorder), but it is interesting to see evidence of (possible) criminal psychopathy from the past. For those researchers who are arguing that psychopathy is a behaviour that existed long before its classification, then historical evidence is supportive.

2. "The Tragedy of the Alresford Twins"

This article is about the stabbing of a youth by one of the "Davies twins", who were "queer creatures indeed - queer in looks, in habits, and in dress". Two identical twins, local fishermen, they were taunted for entertainment by the locals, particularly in the public houses. The stabbing took place after provocation and drinking on both sides.

Two interesting aspects of this report stand out. Firstly, how individuals who are different, particularly in appearance, are treated by local communities. Patterson et al (1989) noted social rejection in childhood as one of the factors leading to adult delinquency.

Secondly, the role of alcohol in relation to crime and violence. For example, Home Office figures for 1990 estimated that 50% of "street crime" and 85% of crime in pubs and clubs was linked to alcohol (Alcohol Concern 2001).

3. "One of the greatest liars of all time"

Born around 1678 and hanged in 1718, John Price was called "one of the greatest liars of all time". His "criminal lifestyle" was based on lying, but also included theft and swindling, and, finally, murder. Though he married and had a "respectable" job (hangman) for a while, he reverted to his old ways and eventually, to murder.

One of the great debates in criminology is about human nature. Are some individuals born bad and will always remain so, irrelevant to life events, or can individuals change for the good (ie: reform)? Obviously, the answer to this question will influence the view on ex-offenders and prisoners who have served their time.

If criminal behaviour has a biological basis, then individuals cannot change, and can only, at best, keep their tendencies under check.

Recidivism and re-offending rates will depend upon the punishment imposed, and/or whether treatment is provided as well. For example, in one London borough in 2001, re-offending rates, after twelve months, varied between 46.2% for community penalties and 66.7% for

custody (London Borough of Havering 2004). However, these figures did not distinguish between types of crimes.

While treatment programmes including social skills training and post-release assistance help reduce re-offending among ex-prisoners (Brewer 2000). But many factors influence the success of rehabilitation programmes in prison. Finding ways to change criminal behaviour and reduce recidivism is one of the "holy grails" of psychology.

4. "The Coggeshall Gang"

Between 1844 and 1848, a brutal gang of house-breakers was active in rural Essex. Not only did they steal valuables, but also food and drink including feasting with captors. They appeared to be well organised and worked well as a group. However, one of their members was captured by the police, and he gave up the other members of the gang. The reason being that the other members had failed to look after his wife as agreed for his silence.

This is a real life example of the "prisoner's dilemma" (PD) game (Axelrod 1984) which is used to study co-operation in psychology.

In the basic scenario, two prisoners are kept separately (without communication), and each must decide whether to confess to the police (known as defecting) or keep quiet (known as co-operating). There are different lengths of prison sentence depending on who defects or not. Usually this scenario is now played with points gained as in the payoff matrix in figure 1.

		PLAYER B	
		CO-OPERATE	DEFECT
PLAYER A	CO-OPERATE	5, 5	6, 1
	DEFECT	1, 6	2, 2

Figure 1 - Payoff matrix of "prisoner's dilemma" game.

Figure 2 shows the possibilities for the gang member in police custody.

	GANG CO-OPERATE	DEFECT
GANG MEMBER IN CUSTODY	look after wife	do not look after wife
CO-OPERATE	goes to prison without giving up gang members (situation A)	goes to prison without giving up gang members (situation B)
DEFECT give up gang members	risk of revenge from other gang members (situation C)	save own skin (situation D)

Figure 2 - PD as applied to Coggeshall gang member in police custody.

In situation A, the gang member pays the penalty for the good of his wife (and other gang members). This is altruism with benefits for his family. Situation B means the individual loses out, and makes no sense other than "misplaced loyalty". If the gang member is in situation C, then he risks the revenge of the others on him or his wife. Though this is the best strategy for his kin.

But situation D is what happened. An agreement was broken. Research on co-operative games found that individuals punish "free-riders" even at their own expense (Fehr and Renninger 2004).

5. "An Essex villain who went lightly to the scaffold"

This article is about the life of "a desperate rogue" called Joseph Wilson, who was hanged in Chelmsford in 1817. Though it was written with some sympathy for the individual: "he was perhaps a victim of the harsh times in which he lived".

During much of his life, Wilson was "in daily contact with crooks of all descriptions, and he must have been learning the tricks of the trade". The influence of others (or the peer group) is a concern today as the cause for individuals committing criminal behaviour. In particular, spending time in prison or with prisoners, as Wilson did.

However, Dennis (2000) has argued against prisons as "schools of crime". Based on questionnaire research with fifteen burglars and fifteen robbers in prisons, it was found that their knowledge of property break-ins was not increased by time spent in jail. The key variable in re-offending was risk-taking.

It is interesting that the influence of others to

change good individuals for the worse is used here, but, in other situations (eg: article 3), an individual is seen as born bad and unable to change for the good. The good individual is vulnerable to the powerful influences of the bad, whereas bad individuals are too strong to be changed for the good. As with many ideas, there are contradictory discourses at work.

The reasons for criminal behaviour are multi-layered, and also depend upon the crime being studied. The motivations for "visible crimes" (like robbery), which most people think of as crime, are usually different to those of sexual-related crimes, "white-collar crime", or driving faster than the speed limit, for example.

CONCLUSIONS

The strength of using historical documents is that they show how things may or may not have changed. Haralambos and Holborn (1995) argued that without historical documents "a rather static view of social life" is produced. Looking at social change is important because individual behaviour is always in a social context, if not socially constructed.

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