Level 3 Extended Project H856

Exemplar Folder 5

ocr.org.uk/extendedproject

Level 3 Extended Project Exemplar 5 - 20/60 Grade E

Assessment Objective	Mark
AO1	4
AO2	4
AO3	8
AO4	4
Total (out of 60)	20

Mod. 4, 4, 5, 4 = 20 SC

OCR
RECOGNISING ACHIEVEMENT

Extended Project (Level 3)

Unit H856

Unit Recording Sheet

Please read the instructions printed at the end of this form. **One** of these cover sheets, suitably completed, should be attached to the assessed work of **each** candidate.

Unit Code	H856		Year	2	0	1	0
Centre Name		Centre Number					
Candidate Name		Candidate Number					

AO	Criteria			Teacher Comment	Mark
1	• Selected a suitable topic and produced a piece of work that reflects a design formulated with the assistance of their teacher/mentor • Taken an adequate degree of responsibility for their project, planning and managing the work through measures addressing its sequencing, its breakdown into intermediate tasks and monitoring its progress. In a group setting, responsibility will have been taken for closely defined tasks assigned by the group • Developed adequate organisational, IT, decision-making and problem-solving skills necessary to realise the project, responding to changing circumstances • Completed the project within the agreed time schedule [0 1 2 3 4]	• Proposed a suitable topic and produced a piece of work that reflects a design negotiated with their teacher/mentor • Taken substantial responsibility for their project, effectively planning and managing the work including sequencing, its breakdown into intermediate tasks and monitoring its progress. In a group setting, responsibility will have been taken for aspects of group work with active participation in group decision-making • Developed proficient organisational, IT, decision-making and problem-solving skills and used them effectively to realise the project, recognising and responding to changing circumstances • Completed the project within the agreed time schedule, meeting most intermediate goals [5 6 7 8]	• Proposed a suitable topic and produced a piece of work that reflects a design proposed to their teacher/mentor and with limited negotiation/support of their teacher/mentor • Taken full responsibility for their project, skillfully planning and managing every aspect of the work. In a group setting, responsibility will have been taken for directing and monitoring aspects of group work with some leadership of group decision-making • Developed proficient IT and sophisticated organisational, decision-making and problem-solving skills and used them creatively to realise the project, effectively managing changing circumstances • Completed the project within the agreed time schedule, meeting all, or virtually all, intermediate goals [9 10 11 12]	Decided on own topic + design. Justified it. Initial support to locate suitable sources of information + then worked independently. Identified problem herself with first title	5

2	• A limited range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Guidance on the choice and interpretation of sources has been given by the teacher/mentor • Some understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed • A limited range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used, where appropriate • Where relevant, some information and/or data has been obtained through working with others in the context of engagement in a business, social-community venture/enterprise or through involvement in a local, regional or international team Extended Project. The learner has participated in a limited way within the context [0 1 2 3 4]	• An appropriate range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Some guidance on the choice and interpretation of sources has been given by the teacher/mentor • An effective understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed • A range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used effectively to further the aims of the project, where appropriate • Where relevant, a range of appropriate information and/or data has been obtained through working with others in the context of engagement in a business, social-community venture/ enterprise or through involvement in a local, regional or international team Extended Project. The learner has been an active participant within the context [5 6 7 8]	• A wide range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Little or no guidance on the choice and interpretation of sources has been given by the teacher/mentor • A sophisticated and perceptive understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed • A wide range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used skilfully and critically to further the aims of the project, where appropriate • Where relevant, a wide range of appropriate information and/or data has been obtained working with others in the context of engagement in a business, social-community venture/enterprise or through involvement in a local, regional or international team Extended Project. The learner has offered leadership or direction within the context [9 10 11 12]	Lots of background research but some difficulty identifying suitable information + discriminary. Initial reluctance to use peer reviewed information overcome N/A 4

3	• Some appropriate skills have been selected and used in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is some evidence of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation • Some appropriate technologies, including relevant new technologies, have been used to assist the process of problem-solving, decision-making and achieving the planned outcome. There is some evidence of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation [0 1 2 3 4 5 6 7 8]	• A range of appropriate skills have been selected and used effectively in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is evidence of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation • A range of appropriate technologies, including relevant new technologies, have been used effectively to assist the process of problem-solving, decision-making and achieving the planned outcome. There is evidence of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation [9 10 11 12 13 14 15 16]	• A wide range of appropriate skills have been selected and used in a sophisticated manner in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is clear evidence throughout of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation • A range of appropriate technologies, including relevant new technologies, have been used in a sophisticated manner to assist the process of problem-solving, decision-making and achieving the planned outcome. There is clear evidence throughout of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation [17 18 19 20 21 22 23 24]	changed title to solve early problem. Organisational skills improved during project. Use of technology ie. log got much better as project went on but could be improved. Limited use of Gantt etc. 6

4	• Although limited in scope, a critical, reflective and independent approach to learning has been developed. A limited attempt has been made to present an accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project • A limited usage of communication skills and media to present a broadly effective review of the development and outcome of the project [0 1 2 3 4]	• A critical, reflective and independent approach to learning has been developed. They present a thorough and accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project • A broad usage of communication skills and media to present an effective and comprehensive review of the development and outcome of the project • The presentation has broadly met the needs of its intended specialist and/or non-specialist audience* • They have appropriately addressed the issue of personal, academic and career development beyond the confines, but informed by, their participation in the project, including their development of transferable skills [5 6 7 8]	• An incisive critical, reflective and independent approach to learning has been developed. They present a perceptive, thorough and accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project • A sophisticated usage of communication skills and media to present a perceptive, effective and comprehensive review of the development and outcome of the project • The presentation has met all the needs of its intended specialist and/or non-specialist audience. The audience was engaged and entertained* • They have addressed clearly and realistically the issue of personal, academic and career development beyond the confines, but informed by, their participation in the project, including their development of transferable skills. They clearly understand what has been achieved and where it can lead them [9 10 11 12]	Reflective skills developed well during project. Some clear evaluation documented Presentation could have been longer	5
				Total /60	20

Guidance on Completion of this Form

1 One sheet should be used for each candidate.

2 Please ensure that the appropriate boxes at the top of the form are completed.

3 Circle the mark awarded for each strand of the marking criteria in the appropriate box.

4 Add the marks for the strands together to give a total out of 60. Enter this total in the relevant box.

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Project and Extended Project – Verification of topic and Title

Level 3 **Line of learning** (when taken as part of a Diploma) N/A

Centre Name _____ **Centre Number** _____

Learner name _____ **Learner Number** _____

The Project title chosen must allow the learner:

- to be fairly assessed at the standard applicable to the Project level (level 1, 2 or 3).
- the opportunity to meet comparable demands to those made on other learners working at the same level
- to meet all of the Learning Outcomes and Assessment Objectives of the Project.

Project title:	WHAT CAUSES BORDERLINE PERSONALITY DISORDER?
Project Aim:	TO WRITE A DISSERTATION IN ORDER TO DETERMINE WHAT CAUSES BORDERLINE PERSONALITY DISORDER
Project Outcome:	DISSERTATION

Project related to the Diploma

The Project title, including its aim and outcome, must be reviewed until Yes can be ticked for each question in the checklist below.

Stand-alone Project

The Project title, including its aim and outcome, must be reviewed until Yes can be ticked for questions 3 to 6 in the checklist below.

Verification of Title Checklist	Yes	No	Comments
1. Is the learner completing the OCR Project/Extended Project as part of the Diploma?		X	If the answer is NO, you are not completing the project as part of the diploma, please move to question 3
2. If the Project is taken as part of the Diploma, is the Project relevant to Principal Learning in either one or both of the following stated ways: - the Project complements and develops the themes and topics for learners' Principal Learning set out in the relevant line of learning criteria? OR - the Project supports learner progression			If the answer is NO you must review the title to ensure that it is related to the relevant Principal Learning in one of these two ways.
3. Is the title a question, a task or a brief?			If the answer is No you must review the title to ensure that the title is one of these three options.
4. Is there an aim and outcome of the project?	X		If the answer is No you must ensure that the title is accompanied by a clear aim and outcome.
5. If this a completely new area of study/activity for the learner, does it allow development appropriate to the level?	X		If the answer is No you must amend the title to ensure that it does.
6. If this is an extension of an area of experience/ study or part of an existing course, does it allow the learner to extend their skills beyond those already developed?	X		If the answer is No you must amend the title to ensure that it does.

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Project Progression Record

Level 3 **Line of learning** (when taken as part of a Diploma) N/A

Centre Name _____ **Centre Number** _____

Learner name _____ **Learner Number** _____

The topic chosen must allow the learner

- to be fairly assessed at the standard applicable to the Project level (level 1, 2 or 3).
- the opportunity to meet comparable demands to those made on other learners working at the same level
- to meet all of the Learning Outcomes and Assessment Objectives of the Project.

Activity	Date	Detail	Supervisor's initials	Comments
The date you started your project	8 June 09	Started mind map ideas		Lots of potential ideas, suggest look at reasons for doing Hen to help decide.
First thoughts about topic and working title	18th Sept 09	Think my question will be about the internet + relationships. Doing background reading.		

Activity	Date	Detail	Supervisor's initials	Comments
If completing the Diploma, • is topic relevant to Principal Learning? If yes • Does the project complement and develop the themes and topics for learners' principal learning set out in the relevant line of learning criteria? **and/or** • does it support learner progression (skills, knowledge, understanding?)		N/A		
What is the title of the project? This could be phrased as a question, hypothesis or statement.	1-10-09 to 23-10-09	what causes Borderline personality disorder?		Problems identified with initial Question – talked through, new question identified by Olivia – wants to do
What do you hope to achieve by the time you complete the project?		to have a better understanding of personality disorders and learn how to write a dissertation		dissertation to help with future uni degree
What form will the assessment evidence for the project take? (ie design, performance, report with findings from an investigation, artefact, [*dissertation – level 3 only*])	5-11-09	dissertation		Discussed various other options (quick) for choosing dissertation as she [illegible]
Have you produced an outline plan to show your project timeline?	20-11-09	keeping a log up + doing a timeline.		Timeline looks realistic but doesn't include delays or problems with getting information.

Activity	Date	Detail	Supervisor's initials	Comments
What will you need to achieve your project? eg tools, equipment, techniques and technologies	4-12-09	i will need journal articles, books, internet etc...		
Will you or have you used a range of sources for your information?		i think using the things above should be enough as i only want to use secondary sources		Balance between peer-reviewed - other source discussed
Is the information selected suitable and sufficient to fit the question/task/brief?		Yes		
Have you identified any links with other areas of study or areas of interest which relate to your project?				
What skills need to be applied to use the information you have collected?	11-12-09	To be able to identify what important to include, + be able to summarise, + being able to keep a track of refs		
Did you apply the tools, equipment, techniques and technologies to use the information that has been collected to complete your project?		i used ganett software to make my timeline. I also organised my computer files to keep my needs sorted out.		Keep backups
What outcomes/objectives have you achieved so far (mid-term review)?		I'm done a lot of background reading. I think i have enough stuff to start writing ~~seamed~~.		On track
Evaluation of own learning and performance so far (mid-term review).		Seemed to be keeping to timeline. Bit worried about my time managment as i have exams come up.		Yes - might be a problem with time management

Activity	Date	Detail	Supervisor's initials	Comments
What have you changed after reviewing your work?	1-3-10	realised now that i need to get some more info for some bits		Good learning point
Final phase - Do you feel that you have achieved all of the outcomes/objectives of your project?	16-4-10	Yes as i hae finished my dissertation. Now working on presentation.		
Presentation of Portfolio • written section (compulsory, even if the outcome is a performance or artefact) • other evidence can be DVD, photographs, slides, CD, artefact, digital technologies etc		written - dissertation		
Describe how you have presented your project to an audience	7-5-10	i presented it to two lecturers and two psychology students. Question & answer section at the end.		Answered questions well.
Have you evaluated your project, taking into account any feedback from your audience?	10-5-10	Yes evaluation included in log. most questions about personality disorder rather then how i did project.		
Date of project submission to teacher	11-5-10			

Notes

This form should be used to record the progress of each learner and may also assist in forming a basis and justification for the mark awarded under each assessment criterion (for example, by indicating the level of support needed by the learner).

At Level 3 it is not intended that the supervisor gives any written feedback to the learner in the comments section. *Verbal feedback may be given by the supervisor; this should not be recorded on this form. Learners may use the comments section for taking notes.*

A copy of this form must accompany each learner's work when it is submitted for Moderation.

Extended project

What causes Borderline perosnality disorder

By

Contents

Title sheet

project progression record - log - pg1

Planning - how i decided on my title - pg4
- mind maps
- Title 1
- Title 2

Research - lesson on using library - pg19
- literature search
- what i found

Process - ~~what~~ how i narrowed it down
- things i read.

Dissertation - pg42

Presentation - pg56

Evaluation - pg59

Date	Details
8 June 2009	Started mind map ideas
18th Sept 09	Think my question will be about the internet and relationships. Also doing background reading
1st Oct 09	Having difficulty with my research, as I can't find much information about online relationships. Also my question is too narrow which is making it even harder.
22nd Oct 09	I have decided to change my question and topic as a whole as it's just too difficult to do. It is a good idea to change question as I feel that on my new topic I will be able to find more information and it relates more closely to what I hope to do when I finish university.
2nd Nov 09	Much happier with this topic and I'm finding a lot of information towards it. I just have to decide what's appropriate to use in my dissertation. I am also talking to library staff about ordering in journals which I think will be useful but which I can only get abstracts for.
30 Nov / 1st Dec 09	At this stage I have a lot of notes which I can use, and I have found that it is a lot more interesting and easy to find information then my first idea. I think at the moment I should be able to do quite well with this.
1st Jan 2010	Everything was going so well but I'm, now having problems with my time keeping, as I have to revise for my exams and do this at the same time. Think I may stop this until after my exams are finished.
1st Feb 2010	Have started up with my project again, as I have finished all my exams. I am now breaking down my dissertation down into sections to make it easier for me to manage with it.
Feb 2010	Overall I think at the moment that it is still going quite well. However as I took all of January off it means that I now will have to make up all the time I missed. However I am still confident that I will be finished completely by May.
1st March 2010	Have got my first problem as I need to do some extra research to be able to ifnd out more about the DSM. This means that I will have to take some time out of writing the dissertation so that I can find that information. To ifnd out about DSM I have emailed a

	psychologist to see if she can help me. However she was unable to so will have to try and find the information some other way.	AO 3
1st April 2010	I have finally finished the dissertation about the same time as I had planned to in my timeline. Now all I need to do is work on my evaluation and references to make sure that they are completely right.	
1st May 2010	Now that I have done everything above, it means that I can now work on my presentation and then evaluation the project as a whole.	AO1

Planning

Choosing a topic and a title 8th June 2009

- When I heard about the extended project I wanted to do it as I thought it would really good for when I go to university as it teaches me how to manage my time, have good presentation skills and learn about the sort of things which I will need to do when I write dissertations at University such as finding out information, and how to work by myself.

- I then deciding on doing something involving psychology as it is an area that really interests me which is good as I will be spending a lot of time on it and so don't want to be doing something which I don't enjoy. Also psychology is what I want to do at university, so by doing this I'm picking up skills which I need, and gaining some extra knowledge which I may need in the future.

- I decided to do a brainstorm about things which I have covered in psychology, or that I found interesting while I been reading journals, newspapers etc...

- Possible titles and areas which I came up with include....

    1. Personality disorders. – I wanted to write about this as it is a mental illness that most people have no idea about, and because it is interesting as some of the symptoms are very similar to Schizophrenia which I have studied in psychology last year. Also I used to know a person who suffered from a personality disorder and so got me interested in personality disorders as a whole.

    2. Does the risk of mental illness grow as you get older? – I thought about doing this as I'm hoping to become a clinical psychologist and so will be dealing with people who have mental illnesses.

    3. Online relationships - why do people get involved in one – This is a very topical area at the moment what with the rise of Facebook and other social networking sites, and so would be interesting to see why some people are drawn towards online relationships and not others and we are studying it in media.

    4. Do certain mnemonics work better then others? – I choose this as it was something which I studied last year in psychology, and wanted to try and bring my knowledge of it into my extended project. I also used them last year to revise for my exams.

    5. Are with born with our personalities? – this links back to the personality disorders idea, but also its interesting as to why if we are born with them, why do some people who get brain damage suddenly changed their personality. I also heard about it on the news which start my interest into it.

    6. Birth order and personality – effects – again this links to the idea above, and whether what order we are born in determines what we end up being like.

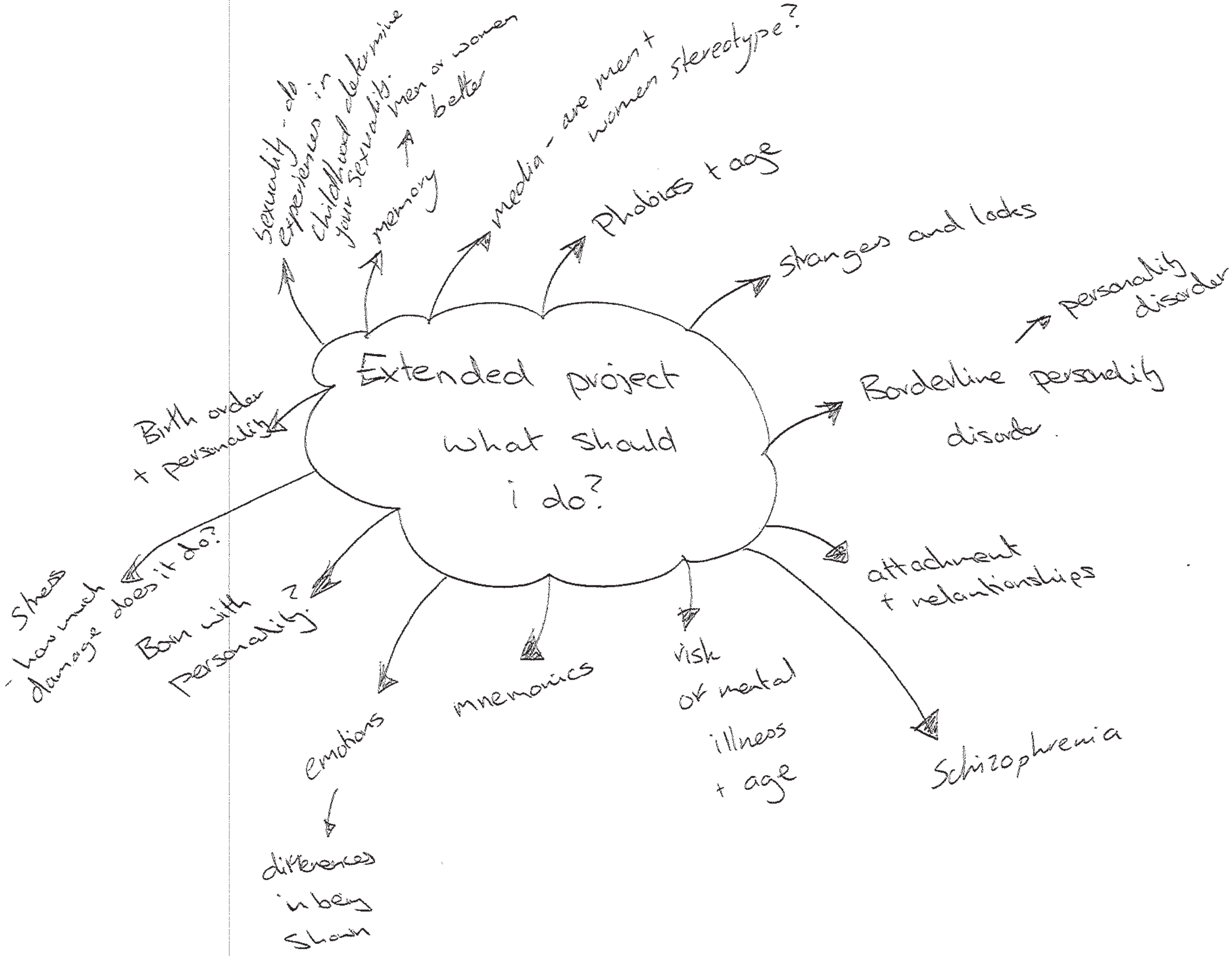
    7. Phobias and age – This is quite a personal idea as when I was younger I used to be really scared of heights but as I'm got older I've kind of lost that fear, and so was wondering if it is possible to lose a phobia as we get older.

    8. Do men or women have better memories? - this again links to something which I have done last year in psychology, but also links to the idea of the battle of the sexes and who is better.

    9. Do people judge strangers by the way they look? – this is something which I will cover in psychology with relationships and perception, and I thought of

doing this as it seemed quite an interesting idea, and as I have knowledge of it already thought it would be easier.

- I'm going to do some more reading, as there is too much to look at the moment, and so need to narrow it down, and decide what really interests me before I can choose my topic.



Extended project what should i do?
Sexuality - do experiences in childhood determine your sexuality.
memory
men or women better
media - are men + women stereotype?
Phobias + age
Stranges and looks
Borderline personality disorder.
personality disorder
attachment + relationships
Schizophrenia
risk of mental illness + age
mnemonics
emotions
differences in being shown
Born with personality?
Stress - how much damage does it do?
Birth order + personality

Mind map of all the ideas i brainstormed.

Sept 2009

June 2004

I need to decide which area I want to focus on before I can even start doing this dissertation.

- I decided to group them all together depending on whether they relate together. The groups are...

    1. Memory
    2. Things to do with Personality
    3. mental illnesses
    4. sexuality
    5. attachment
    6. media
    7. things to do with age

- The next stage was looking into each group...

Memory

There were two areas I had put on my mind map, gender differences and how you can use your memory to help you. I started to look for information by looking into my textbook from last year, to see what information I could find out from there. When I looked into gender differences my first research shown that I would have to pick a particular bit of memory, to see if there was any gender differences for example I looked into an article about spatial working memory model and gender differences, and found that the whole topic was a bit too dry to do.

When I read more about mnemonics, I found that even though it was interesting I couldn't work out where I could actually take it, as it is a very limited topic.

Sexuality and Media and relationships

Again these are very broad areas, and I will be covering them in my next section of A levels under the gender, media and relationships topics, but they are interesting.

Personality and mental health

When I start to look at personality and mental health, I realise that this was a very interesting area, and there was a link coming up between personality and mental health. What put me off schizophrenia is even though it was interesting I had already covered it in the spec, which is the same for phobias, and so thought about drawing my attention towards personality disorders instead as it is something which I haven't done yet, and is also something which I may come across when I'm a clinical psychologist. Also I decided to move more towards personality disorders as when I was studying schizophrenia at the start of the year, the things which interested me most was how hard it was to diagnose it and about the nature vs. nurture debate. I'm not sure on what my title will be yet but I'm interested in this area.

when i looked this up on infotrac, there was so many things. that i thought it would take too long to narrow it down. AO1

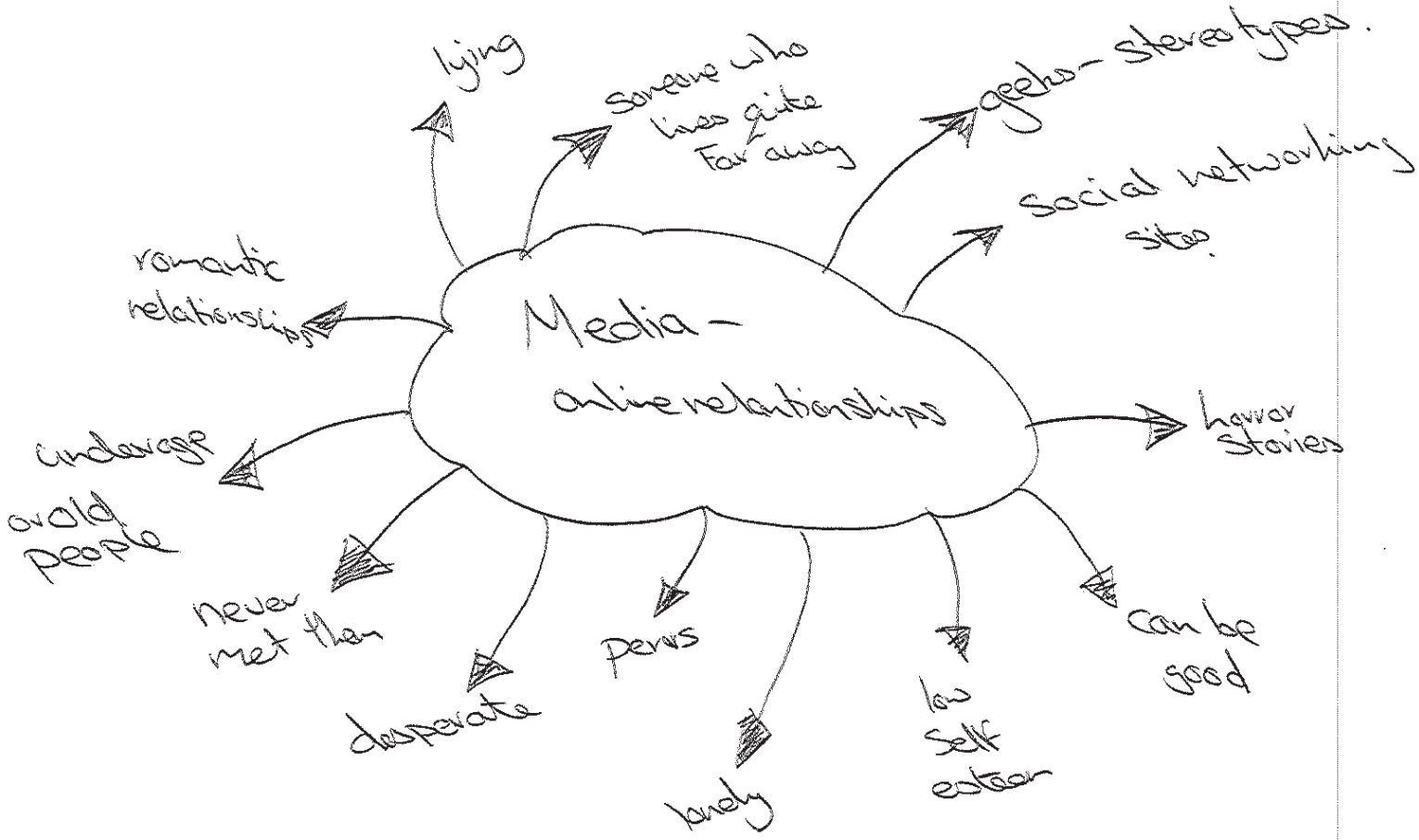
15th June 2009

How I'm, going to do it

- When trying to decide what to do, I first of all thought of looking at the different formats so I did a table.

Formant	advantages	Disadvantages
Dissertation	• Get a lot of information into it • Don't have to narrow it down • Don't have to collect primary data • Can pick up useful skills – research and information skills and writing skills	• Might not appeal to a wide range of people • Getting access to good information such as peer reviewed articles • Deciding what to include as there is a lot of information which you could use
Report or investigation	• Could access peoples personal experiences • Pick up useful skills I may need at university – research skills, report writing skills	• Ethics as it is a sensitive area • Organising – getting hold of people – sample • Don't have experience of dealing with people with mental health
Production	• Get ideas across to a wide range of people • Get people interested in the topic • Be fun to do	• You would have to narrow down on what you have to do, maybe miss out important buts • Need more people to do it • Haven't got the necessary skills
An artefact	• Dramatic effect	• Can't work out how it would work • Need to be artistic person

A01


Media - online relationships
lying
someone who lives quite far away
geeks - stereotypes.
social networking sites
romantic relationships
underage
ovold people
never met then
desperate
pervs
lonely
low self esteem
can be good
horror stories

Brainstorm of things to do with online relationships.

June 09

Timeline for Online Relationships

June 09
- Start thinking about my topic
- Brainstorm ideas
- Identify lots of different interests
- Look at different formats.

July 09
- Start writing out my questionaire
  - thinking about what questions I want to use.

August 09
- get my questionaire ready to be hand out –
- decide on sample, who I'm going to do it etc....

Sept 09
- Carry out my study
  - give out questionaires + consent forms

Nov 09
- gather all my data. Start to process it

Dec 09
- Finish processing data.
- Start getting into a for my report

Jan 10
- Sort out all my info work out how to present it.

Feb 10
- Start the report –
- ~~Start with~~

May 10
- Finished. report

had to give up on this idea. I found that it was too hard, and unethical to continue.

June 09

Why do people get involved in online relantionships?

One of the most rapidly developing area of interest for psychologists is the issue of cyberspace relationships, and why people get involved in them.
An online relationship is defined as something of "a romantic or sexual relationship that is initiated via online contact and maintained by electronic conversations"
But can relationships between people who never see, smell, touch or hear each other really be supportive and intimate?

Griffths (2000) suggests that the global nature of Internet cyber relationships add an exciting dimension of cultural diversity. Also nowadays, it seems that people become friends first and then fall in love. This is also true with online relationships. However on the internet, proximity and the familiarity that goes, with meeting someone in real life is not there, so instead of that you now have a situation where it depends on how much you talk to that person, instead of where there are geographical.
Also some of the highly visible characteristics that are usually used to form judgements about people are not factors in internet interaction. This means that a big disadvantage of text driven or online relationships is that physical cues such as voices, facial expressions or body language are missing, which makes it harder for people to intercept what the other person actually means. As for example, you might think they mean one thing when really they mean something completely different. So the relevance of physical attraction to relationship development is seriously undermined.

It is also a proven fact that over 30% of our communication is conveyed though the use of body language, which is absent from Internet communications. So surely, because of that it will cause problems while interacting in this medium, especially as you can't see the people who you are talking to most of the time, unless they have a webcam. Because of this, it means that the concept of 'love at first sight' appears to be impossible as you don't know the person and can't even see what they are real like. But also that the established models of relationship development no longer appears to work, because basically you are throwing all the rules of love out the window when you get into an online relationship.
Lea and spears (1995) argue that once the social dimension of attachment becomes more important then the emphasis on physical attraction, it could lead to some problems, to do with the way which people behavior with each other.
How ever it has been suggested that an online conversation between two people in 'real life' bridges the gap between writing and speaking, and so can actually do the person well, and help them to increase their speaking and literary skills. This combined with the use of emotions and regularly checking out of what the other person is saying enables the person to have a good level of communication. Also because the person can't see you then your influence on that person is determined by your skill at communicating, as well as the quality of your ideas.

- started to make some notes about topic

Interview for extended project

1. Are you male or female?
2. How old are you?
3. Where are you from?
4. Have you ever been in an online relationship before or do you know someone who has? If so, how did it make you feel?
5. If no, How do you feel about people have online relationships with other people who they don't even know?
6. Why do you think people get in online relationships?
7. What kind of people do you think get involved in online relationships or uses dating sites?
8. Do you think that people are online are the same person or not? Like do they make things up about themselves?
9. Is it easier to talk to people online then it is to talk to people face to face?
10. Which of these do you use the most when communicate online – Messageboards, Chartrooms, or something else?
11. Do you think that cyber relationships are real relationships?

• Some questions I thought up.

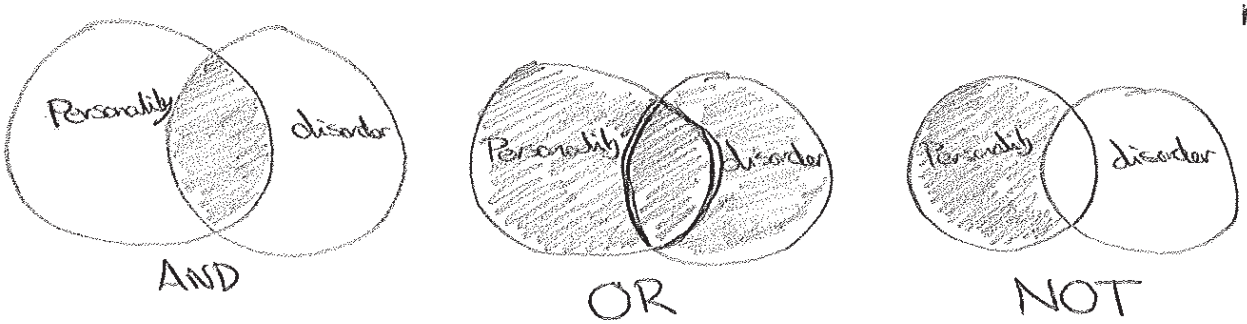
- I decided to do media and online relationships as it was something which is very topical at the moment especially with the rise of social networking sites such as Facebook. I have also decided to do this project as a research project as I wanted to find out about peoples own personal views about online relationships and whether they have ever been in one.

- The project started off fine, but as I was designing my questionnaire I found that some of the questions I had used could end up being very unethical as I have ask people about there own experiences of online relationships and other personal information.

- I also had the problem that I was unable to find much information out about it, because of the fact that as it is a fairly new topic in psychology, that meant that there wasn't a lot of other research or information out there that I could use.

- As a result, I then decided to try a new topic which could be more easier to do. This lead me to think about personality disorders as during my first search for research before I had decided to online relationships, I had managed to find quite a lot of information out about it. Also it was more like what I wanted to do in the future and so would help me more in the long run. As a result it meant that I would have to do a completely different timeline, and mind map for that topic.

AO1



Having do this, it has helped me to get it clear in my mind, what to do. Even though I had same amount of disadvantages in the dissertation, as for the others, the ones in there were things which I could overcome such as getting access to good information and making it too appeal to a wider range of people.

- Also some of the other disadvantages of the other topics are that some of them were be too big to try and overcome such as the fact I'm not a artistic person etc…

This is my ideal timeline - with the new question

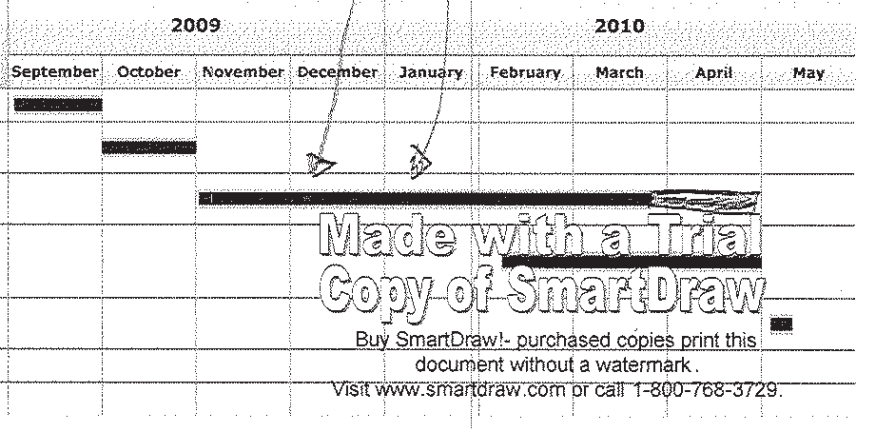
- might have to spend more time for journals

re think about ideas for topic

didn't start doing research until Dec

had to stop due to Exams - had to extend it because of exams

Number	Task	Resource	Start	End	Duration	% Complete
1	Think of ideas for Topic	Brain storm Ideas	3/9/2009	30/9/2009	18	100.0
2	Narrow it down to the Topic of interest	Internet, Books, Journals	1/10/2009	31/10/2009	22	100.0
3	Background research on personality disorders	Internet, Books, Journals	2/11/2009	26/3/2010	102	100.0
4	Start to write dissertation	Notes, Internet, Books, Journals, Word	8/2/2010	30/4/2010	57	100.0
5	Produce Presentation of Project	Notes, Power point, Dissertation	4/5/2010	10/5/2010	5	100.0



A03 A03

New timeline to my new proje -

Sept 09

this helps to show you how well you are managing your time.

Adapted from: http://advising.wayne.edu/hndbk/time.php

Time Management Questionnaire

Score yourself on the following questions; **2 for "always", 1 for "sometimes", 0 for "never"** and tally your score at the bottom of the column.

2 I do things in order of priority.

2 I accomplish what needs to be done during the day.

2 I always get assignments done on time.

1 I feel I use my time effectively.

1 I tackle difficult or unpleasant tasks without procrastinating.

1 I force myself to make time for planning.

1 I am spending enough time planning.

2 I prepare a daily or weekly "to do" list.

2 I prioritize my list in order of importance, not urgency.

1 I am able to meet deadlines without rushing at the last minute.

2 I keep up-to-date on my reading and homework assignments.

1 I prevent interruptions from distracting me from high priority tasks.

1 I avoid spending too much time on trivial matters.

1 I am spending enough time on academic matters.

2 I plan time to relax and be with friends in my weekly schedule.

2 I have a weekly schedule on which I record fixed commitments such as classes and work hours.

2 I try to do the most important tasks during my most energetic periods of the day.

1 I make constructive use of my commuting time.

1 I periodically re-assess my activities in relation to my goals.

1 I have discontinued any wasteful or unprofitable activities or routines.

0 I screen and group my telephone calls to allow for control over telephone interruptions.

1 I judge myself by accomplishment of tasks rather than by amount of activity or "busy-ness".

2 My actions are determined primarily by me, not by circumstances or by other people's priorities.

1 I have a clear idea of what I want to accomplish during the coming semester.

1 I am satisfied with the way I use my time.

34 **Score**

45 - 50 points: You're on your way to becoming head of a major corporation!

38 - 44 points: You probably own an electronic organiser and have organized your sock drawer.

30 - 37 points: You are managing your time fairly well, but sometimes feel overwhelmed.

25 - 36 points: Your college career is likely to be stressful and less than satisfying unless you take steps to begin to manage your time more effectively.

less than 25 points: Your life is one long roller coaster ride, out of control.

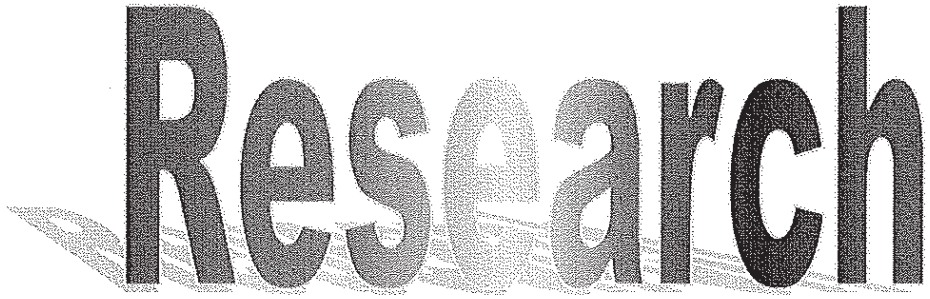
Shows that things can get on top me.

to overcome this i can organise my work so that i don't have so much to do at one time.

New Question

Brainstorm of everything to do with personality disorders.

Sept 09


Research

journals - was given by librarean.

Shows how I can get into

EAST DEVON COLLEGE – THE LEARNING CENTRE

General Project Research skills - finding sources of Information – Dec 2007

A. NINE QUESTION STEPS FOR ANY PROJECT

1. What do I need to do? - formulate and analyse need
2. Where could I go? - identify and appraise likely sources
3. How do I get to the information? - trace and locate individual resources
4. Which resources shall I use? - examine, select and reject individual resources
5. How shall I use the resources? - interrogate resources
6. What should I make a record of? - recording and sorting information
7. Have I got the information I need? - interpreting, analysing, synthesising, evaluating
8. How should I present it? - presenting , communicating
9. What have I achieved? – evaluation

From: Marland, M. (Ed), Information Skills in the Secondary Curriculum. Methuen for the Schools Council, 1981

B. GETTING THE MOST FROM THE E.D.C. LIBRARY COLLECTIONS

it was very useful as it help me to know where to look.

The Print Collections: Books, Journals and Special Files

1.1 **Books**

Use the **Learning Resources Catalogue** to find all the material on a topic, although occasionally browsing the shelves can also yield unexpected information and materials.

- The "**General Search**" function on the Catalogue works much like an internet search engine - you can enter any word associated with a book or pamphlet including author name, word from the title or subject keyword.
- "**Advanced Search**" is helpful in narrowing down a large number of results by specifying a particular type of material (e.g. video) or searching a specific file (e.g. keyword). It also allows you to combine terms using AND/OR/NOT.
- Remember that the **Catalogue can be consulted via any internet computer** in college or, outside, via the Library website at "http://library.edc.ac.uk"
- Watch out for some items which are located either in separate **Reference** or **Oversize** sequences.

1.2 **Quick Reference Books**

The Quick Reference section has a few key general sources such as encyclopaedias, dictionaries and collections of statistics. Other reference books are shelved under the same Dewey class numbers with the lending books on the subject.

1.3 **Special Information Files**

The Education section (370s) has a collection of reports and circulars from the funding and inspection bodies and background papers from educational research organisations. Special reports from the Financial Times are filed with books for countries (914 – 919), business topics (658), and the world economy and development (330).

1.4 **Examinations and Assessment Bodies**

Publications such as syllabuses and examiners' reports together with guidance notes are held in a special collection at the Help Desk. Past examination papers are also available from this collection.

1.5 **Journals and newspapers**

- The **Current Periodicals** area near the main door displays all the journals and newspapers currently taken by the Library. It is arranged by broad subject headings. This allows you to see the full range of journals taken for each subject – a printed list for each subject is available on the display shelves.
- **Back Issues** are kept for most titles - for any period from one to ten years. These are to be found partly under the display shelves for the current issues and partly shelved with the books on the same subject.
- **Holdings Lists** are available for EDC Library and for Plymouth University Libraries.
- **Indexes to journal articles**
  These are available in electronic form – see **Infotrac** and **Electronic Journal Indexes,** sections 2.2. and 2.3 below.
  Listing journal articles by subject across a range of journals, these can help you find specific articles on a topic from the print journals we hold or help you identify articles which can be downloaded or obtained from other libraries.

The Electronic Collections

2.1 **SID and Moodle**

Lecturer notes and handouts, PowerPoint presentations, tests and exercises and other on-line learning materials have been placed in the Student Information Directory (SID) and in the Managed Learning Environment (Moodle). These can be accessed from the Student Intranet Homepage in College. Details of how to access these from home are given in our leaflet "Library@Home".

2.2 **On-line Learning Materials**

The Student Intranet Homepage has links to several services offering on-line learning materials. The NLN materials cover many courses taught in the College, while others, such as Hairdressing Training, are for single subjects. Details of how to access these from home are also contained in the "Library@Home" leaflet.

2.3 **InfoTrac** ← some of the stuff on here doesn't help much.

Two databases are available using the link to InfoTrac (on the student intranet homepage or via the library website).

- The **newspaper database** contains up-to-date files of most major British newspapers and includes full-text of the over 18m articles.
- "**Onefile**" indexes over 6,000 journals and has over 66m references, more than half of which come with full text. A simple search screen allows searching by author, title or subject keyword and results can be filtered by date, journal title or whether full text is available.
- InfoTrac can be accessed from any internet computer in College without passwords. Out of College you will need an **Athens Username and Password** - library staff can arrange for an account to be set up in your name for home use.

2.4 **Electronic Journal Indexes**

As well as InfoTrac, it is possible to use other electronic journal services to help you unlock details of specific articles - either from the EDC print journal holdings or from the holdings of other libraries using Interlibrary loan. You will need an **Athens account** to access these:

- ZETOC - The British Library's table of contents service covering 20,000 titles.
  (E-mail alerts are available for specific journals)
- Ingenta Journals - indexes many of the British academic titles
- Blackwell-Synergy - indexes nearly 850 British academic titles

The Audio Visual Collections

3.1 **Videos**
The main College video collection is held in the Learning Centre. Outline details of each programme is held on the **Learning Resources Catalogue**.

3.2 **Tapes and slides**
These can be useful for certain subjects. For example audio tapes/CDs give extra support for language learning, while slides are a valuable addition to the study of art and other visual subjects. Details of all audio-visual programmes are on the **Learning Resources Catalogue.**

C. GETTING INFORMATION FROM OUTSIDE E.D.C.

4.1 **Books - what can I get from other libraries?**
The **University of Plymouth Library Catalogue (Voyager:** Http://voyager.plymouth.ac.uk) and the **Devon Library Services** catalogue (http://www.devon.gov.uk/index/culturetourism/libraries/library_catalogue.htm) can be searched from any internet terminals. Items found on these catalogues can usually be obtained fairly quickly and cheaply by **interlibrary loan**.
COPAC (http://copac.ac.uk/copac) is the combined universities library catalogue and is easy to use and reliable to access. It is useful for confirming book details before requesting them.
The British Library (http://portico.bl/uk) also allows its catalogues to be searched over the internet. The Neilsen Bookdata files are also available on the college network and this service can be used to identify the titles currently available from British publishers.
Interlibrary loan requests for books normal take 2 -3 weeks to be supplied. Charges are made according to whether items can be obtained in Devon or have to be sourced from outside the county when higher charges apply. Staff at the Help and Enquiry Desk will assist you with the request process. We have links with Plymouth and other universities and the British Library.

4.2 **Journals**
You can use the services mentioned in 2.2 and 2.3 above to identify specific journal articles to obtain by interlibrary loan. A photocopy of the article will normally be supplied and you may retain this after first reading. The article will usually be posted to your home address and supply takes about 7 days normally. Again charges vary according to where the item can be sourced.
In addition to the general indexing services already mentioned there may be specialist subject databases available, some freely accessible on the internet. Ask Learning Centre staff to help you access these.

4.3 **The Internet**
The amount of information available over the Web is, of course, vast. Here are a few pointers to **directory and gateway services** (Links from the Student Intranet Homepage) which offer a means of finding information which is an alternative to the use of general search engines.
Use these listing and link sites when search engines fail you or if you want to browse subjects, e.g. **BUBL (**Http://bubl.ac.uk) or **INTUTE** (Http://www.intute.ac.uk). Many university libraries also maintain subject guides to useful websites.
Use search engines if you can specify your requirements exactly in the form of keywords. Practice using different engines and get to know how they work and how they differ. The **Virtual Training Suite,** part of **INTUTE**, has a range of subject tutorials in using the internet, while the **"Internet Detective"** site will help you develop the skills to evaluate information on the web effectively. *See also our leaflets: "Surfing the Net" and "You're the Judge".*

4.4 **Organisations and People**
The **Charities Digest** and the **Voluntary Agencies Directory** (REF 362.7) both list charities covering a wide range of problems and client groups and include website addresses.
Key Organisations (Q REF) lists organisations, giving details of their addresses, telephone numbers and activities. These sources will enable you to write for, or download, information about a wide range of topics or to contact an expert in the field.
Open **discussion, newsgroups and mailing lists** on the web are also a good way of contacting experts in a particular field. Subject-based lists are included in the Virtual Training Suite Internet Tutorials on the Intute website.

D. HOW DO I GET TO THE MATERIAL? INTERLIBRARY LOAN AND VISITING OTHER INSTITUTIONS

Visiting other libraries. Likely sources:

- **Devon Library Services** - Exeter Central Library and branches
- **Exeter University Library** - good for periodicals, indexing and abstracting services (reference only)
- **Plymouth University** - nearest site: Education Faculty at Exmouth (Reference only). Students on University of Plymouth partnership courses can request University Library materials through EDC Library or apply to be associate members through EDC Library and use University libraries directly in person.

Interlibrary Loan

- filling out the request card - full details of books. For journal articles the request form includes a copyright declaration which the student must sign and spaces for all necessary information.
- allow enough time: 5 - 10 days for journal articles, 1 - 4 weeks for books.
- be realistic about the number of requests and type of material. Remember that charges are made and that going beyond Devon is more expensive. You will be notified by post when books are in and have journal articles posted directly to you.

Write to organisations direct - look in the reference collection for names and addresses

Use the Internet to access resources remotely or use services such as e-journals or newsgroups or contact charities.

E. REFERENCING

Use of the **Harvard Referencing System** is recommended. There are many guides on the Internet. A clear and detailed introduction is available from the University of the West of Scotland at: http://www.paisley.ac.uk/schoolsdepts/library/guides/referencing-guide.asp.
A flow-chart for referencing is available from the University of the West of England at: http://www.uwe.ac.uk/library/resources/general/info_study_skills/refs.htm.
The EDC Learning Centre has copies of: PEARS, R. & SHIELDS, G., Cite them right: the essential guide to referencing & plagiarism. Pear Tree Books 2005 (REF 371.30281q).

L.E.B. Jan 06 (Rev Dec07 & Jan 08)

REQUEST FOR A JOURNAL ARTICLE

shows how to request a journal article (A05)

To: F e / Other Libraries

Journal Title: .....

..... **Class Mark:** .....

Article Title: .....

.....

Author(s) / Editor(s) (inc initials / forenames) .....

.....

Year: ..... **Volume No:** ..... **Part:** ..... **Pages:** .....

Where did you find this information? .....

Item not required if supplied later than: .....

Please supply me with the item described above. I have not previously been supplied with a py of the said material by any librarian and I undertake not to use the copy except for the purpose of research for a non-commercial purpose or private study.

Signed: ..... **Date:** .....

FOR UNIVERSITY OF PLYMOUTH USE

Date received: .....
Check catalogue: (date/initials).....
.....
Send request: (date/initials).....
Reports:.....

FOR COLLEGE USE

Date applied:.....
..... / OTHER
Locs: .....
BLReq No:.....
Date received: .....

A photocopy of this article will be posted to you as soon as it is supplied or you will be notified if cannot be supplied. Please write your name and address clearly in the box below.

Article Title: .....

Reader's Information:

Name and Address:

Tel Number: .....

Student Number:.....

☐ **This item is now available and will be kept until:**

.....

☐ **Sorry, this item cannot be supplied by the date you requested.**

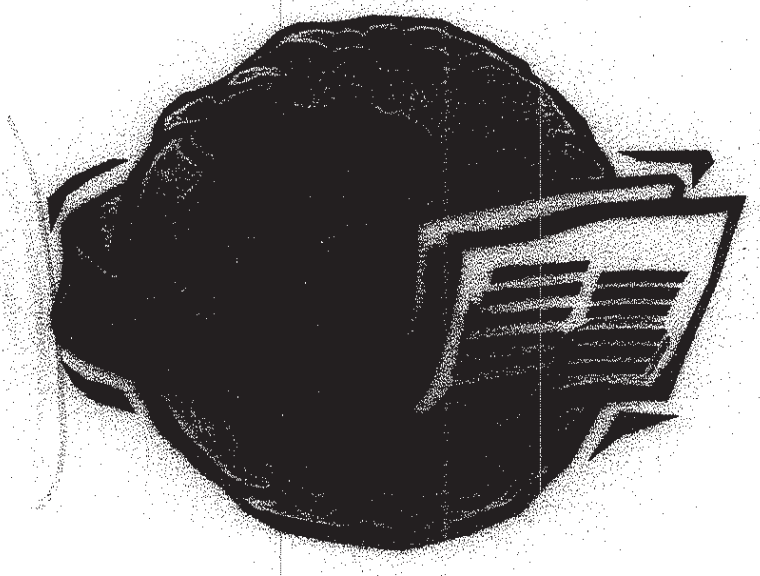
om: H
Tel:

This is what we have in our college

INFOTRAC

ON – LINE JOURNAL SERVICE

Now in the Library & Learning Centre



Ask at the Enquiry Desk for a 5 minute demo

As part of the Library & Learning Centre's commitment to making information available any time anywhere, we are pleased to announce the arrival of Infotrac the on-line service that allows you to access a vast collection of full text journals and newspapers at the click of a mouse button.

Two databases are available:

– *Infotrac Onefile* contains over 6,000 journals, half of which in are full text

- *Infotrac Custom Newspapers* includes many major UK broadsheets, tabloids & regional titles.

Both databases are updated daily and can be accessed on the machines in the Library or via the Internet on any College computer.

Go to the link on the Library or Student Home pages

For home access you will need an individual log-on and password. Please speak to Library staff to arrange this.

I used this as well to help me with my search terms.

THE UNIVERSITY OF [redacted] LIBRARY

The Concept Map: How to Formulate Literature Searches

Information Services, Philson Library

Sue Foggin	External ph. 0[illegible]	; Internal ph. 86123
Lorraine Nielsen	External ph. 0[illegible]	8; Internal ph. 86158
Anne Wilson	External ph. 09	6; Internal ph. 86126
Laura Armstrong	External ph: 0	Internal ph. 86132
Fran Clements	External p[illegible]	Internal ph. 86132

The most productive searches are those where the information seeker has spent time working out a search strategy before actually using the databases and catalogues. A proper search strategy is critical to any database search and time spent on preparing it will result in effective and relevant information retrieval. Effective information collection depends on the design of a proper research and search strategy

- Select your topic and formulate your research question
- Identify and separate the main concepts in your question

Example of a *concept map*:
If you were interested in the impact of smoking on pregnant women and their babies, you would

- state your topic as a question: ***What effect does smoking have on pregnancy outcome?***
- write it out as if it were an article to answer your question: ***The side effects of smoking during pregnancy***

Always identify and separate the concepts involved in a question:

side effects		smoking		pregnancy

Beneath each concept list all keywords which describe that concept. Include all alternatives (synonyms, broader and narrower terms, acronyms, alternative spellings, singular and plural words). Consider using subject dictionaries e.g. MeSH (Medical Subject Headings), handbooks, encyclopaedias, and reference sources to find keywords.

side effect/s		smoking		pregnancy
adverse effect/s		cigarette/s		pregnant women
risk/s		marijuana		fetus

When searching,

- terms listed vertically (alternatives) should be connected by **OR** to broaden each search concept
- terms between columns should be connected by **AND** to narrow the focus of the search

	AND		AND	
side effect/s		smoking		pregnancy
OR		OR		OR
adverse effect/s		cigarette/s		pregnant women
OR		OR		OR
risk/s		marijuana		fetus

Subject heading Search and Keyword Search

Subject Headings searching

- When searching some databases such as Medline and PsycInfo you are 'mapped' or directed to the most relevant subject heading(s) relating to the word or phrase that you have entered. Sometimes this heading will match what you have typed, but often a different term, or a list of terms may be presented. When you are presented with a list of subject headings, select the most relevant, being careful not to mix concepts in inappropriate ways.
- If there is no subject heading to match your requirements, you will need to do a keyword search. When you have done a keyword search select a few references that best meet your requirements. Check the subject headings that the database has assigned to these references. You can then do another search using those subject headings. This is called lateral searching.

Keyword searching

Other databases (e.g. Current Contents) search only via keyword. When this is the case you need to

- think of as many alternative words, phrases and variations as possible.
- use truncation to include plurals or variant endings. Truncation refers to shortening a word or eliminating some characters from a longer term to pick up variants. Truncation symbols, (such as * ? $), are used during the search to indicate to the computer to substitute any character(s) for the symbol. Truncation symbols vary from database to database. In the OVID databases the $ sign is the truncation symbol, e.g. *adolescen$* searches adolescent, adolescents, adolescence.

Performing the search

Always search for the keywords or subject terms which define each concept separately, before combining them to find reference sets which reflect all the terms you have searched. This approach

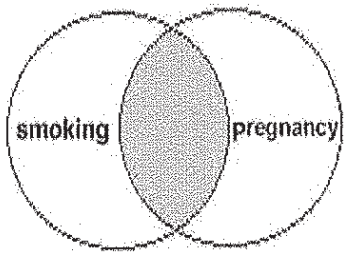
- will make your search more specific, as each concept will be well defined
- will make your search more flexible as you will be able to add or remove keywords from a set without affecting the other sets

Combining sets

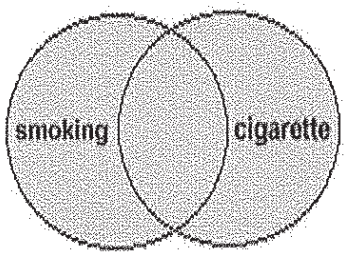
Use Boolean logic operators **AND, OR, NOT** to combine results.

- **AND** narrows a search by combination. Something from each concept must appear in the reference to be retrieved. It is used to combine all the concepts.
- **OR** broadens a search by inclusion. It is used to include synonyms, related, broader and narrower terms describing the different concepts.
- **NOT** narrows a search by exclusion. It excludes any references containing the specified term.

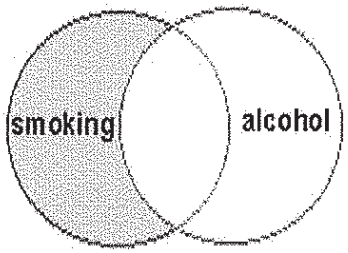
The shaded area represents the retrieved material



AND



OR



NOT

Modifying Results

If you have not retrieved the references that you want, or there are too few or too many, consider

- substituting **narrower** (more specific) search terms for broader ones if there are too many references
- including **broader** terms as well as very specific ones if there are not enough references
- **lateral searching**. Choose a good article from the set and look at its subject headings, then use these subject headings to refine your search
- **limiting** by date, language, publication type etc., if your search results are relevant but there are too many of them
- checking that you have selected the most appropriate **database** for your search

Journal of Comparative Psychology
2003, Vol. 117, No. 4, 371–379

0735-7036/03/$12.00 DOI: 10.1037/0735-7036.117.4.371

"Right-Trunkers" and "Left-Trunkers": Side Preferences of Trunk Movements in Wild Asian Elephants (*Elephas maximus*)

Franziska Martin and Carsten Niemitz
Freie Universität Berlin

In this article, the side preferences of feeding-related trunk movements of free-ranging Asian elephants (*Elephas maximus*) were investigated for the first time. It is hypothesized that a functional asymmetry of the trunk is necessary to perform skillful feeding movements more efficiently. This might be connected with a corresponding hemispheric specialization. Video recordings of 41 wild elephants provided frequencies and durations of the following trunk-movement categories: object contact, retrieval, and reaching. In each category, individual side preferences were found. The strength of side preferences varied between the trunk-movement categories and the sexes. Mean durations of retrieval and reaching correlated negatively with the strength of side biases. Comparing the side preferences in the unpaired trunk with analogous phenomena in other unpaired grasping organs and in primate handedness, the authors discuss possible explanations for the evolution of asymmetries in unpaired grasping organs.

The trunk of an elephant is a multifunctional organ. Besides serving physiological functions like breathing, smelling, drinking, and producing sounds, the trunk serves for a wide spectrum of mechanical functions as well (Kurt, 1986; McKay, 1973; Shoshani, 1997). Its numerous abilities comprise powerful tasks like pulling off fibrous plant parts and transporting tree trunks as well as highly sensitive tasks such as selecting suitable parts of food plants or picking up objects as small as peanuts from the ground (Shoshani, 1997, 1998). Experiments have shown that elephants are able to discriminate groove widths of 0.25 mm with their trunk tips (Dehnhardt, Friese, & Sachser, 1997). Moreover, handling and even manufacturing of tools have been reported (Chevalier-Skolnikoff & Liska, 1993; Hart, Hart, McCoy, & Sarath, 2001; Kurt, 1986) and discussed by Hart et al. (2001) with respect to cognitive capacities. A high density of encapsulated and free nerve endings, small corpuscles, and also vellus vibrissae allows for the high sensitivity of the dorsal trunk finger (Rasmussen & Munger, 1996). For food preparation and intake, the trunk follows a so-called feeding cycle, which is composed of repeated sequences of distinguishable trunk-movement categories, such as selection of food plant parts with the dorsal trunk tip, manipulation of the plant with certain techniques, transportation of prepared food portions to the mouth, and moving the trunk back toward a new food object (Kurt, Weisz, et al., 2001; Martin, 2001; Martin, Kurt, & Niemitz, 1999).

Anatomically, the trunk is of a surprisingly complex structure. About 150,000 muscle fibers (Shoshani, 1998) are arranged in long, round, and oblique layers around the two nostrils (Boas & Paulli, 1908). This provides the trunk with extremely high flexibility and nearly unlimited freedom of movement. Because the trunk muscles have neither skeletal nor cartilaginous support, all movements result from very precisely coordinated contractions of synergistically and antagonistically working muscles. They are bilaterally innervated by the proboscidean nerve, which is formed by the union of maxillary and facial nerve branches and runs along both sides of the proboscis (Boas & Paulli, 1908; Mariappa, 1986; Shoshani, 1997). It is assumed that the cortical representation of the trunk occupies a large area of the brain, although this remains unobserved (Cozzi, Spagnoli, & Bruno, 2001; Haug, 1970).

Because its biomechanical features are regarded as a muscular hydrostat, the trunk is most comparable with tongues and tentacles (Kier & Smith, 1985). Tongues as unpaired organs generally have no radial muscle fibers but instead have longitudinal, vertical, and transverse muscle fibers. These are innervated by the bilateral hypoglossal and lingual nerve (Doran, 1975). The extensive bilateral representation of the tongue in the cortex reveals a clear somatotopic organization (Picard & Olivier, 1983).

In contrast to the trunk, the prehensile tail of spider monkeys, another unpaired grasping organ, contains the caudal vertebra as skeletal support for the uniformly distributed muscle bulks. Laterally, dorsally, ventrally, and transversely extending muscles enable precise dorso–ventral, lateral, and rotational movements (Lemelin, 1995). Accordingly, the somatotopic representation of the contralateral half of the tail occupies a relatively large area of the cortex (Pubols & Pubols, 1971). Unilateral extirpation experiments have demonstrated a bilateral motor innervation (Fulton & Dusser De Barènne, 1933). In view of the obvious neural effort for control in other unpaired organs, the question arises of how the elephant copes with the coordination and control of its trunk movements.

Because of the diverse mechanical functions and manipulative abilities of the trunk, it is obvious to draw parallels to primate hands and their motor neural control (Onodera & Hicks, 1999). In

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primates, hand preferences, grasping techniques, and hand motor control as well as their implications for cognitive processes have been studied intensively (e.g., Fagot & Vauclair, 1991; Hopkins, Cantalupo, Wesley, Hostetter, & Pilcher, 2002; Hopkins & Pilcher, 2001; MacNeilage, Studdert-Kennedy, & Lindblom, 1987; McGrew & Marchant, 1996, 1997a, 1997b; Napier, 1962; Parnell, 2001; Ward & Hopkins, 1993; Warren, 1980). Because of the descending pathway of motor neurons from one cortical hemisphere to the contralateral limb and body side, the preference for one limb to perform a task goes along with a specialization of neural control in the corresponding hemisphere of the motor cortex (Geschwind & Galaburda, 1985; Walker, 1980). Mechanisms inhibiting interferences between both hemispheres are supposed to avoid duplication in costly neural substrate, which consequently doubles the functional capacity of the brain (Gazzaniga & Le Doux, 1978; Levy, 1977; Rogers, 2000).

Unlike paired grasping organs such as hands, the unpaired trunk has no choice between a right and a left organ to perform a task. Moreover, the morphological symmetry of the trunk does not imply side preferences at first sight. The ontogenetic origin of the trunk, which develops by a fusion of the upper lip and nose (Shoshani, 1998), draws attention toward functional asymmetries of facial muscles. In primates, asymmetrical contractions of facial muscles in communication (Fernandez-Carriba, Loeches, Morcillo, & Hopkins, 2002; Hook-Costigan & Rogers, 1998) and feeding context (Hook-Costigan & Rogers, 1995) have been demonstrated and discussed with regard to related superiority of the contralateral hemisphere. A comparable asymmetrical contraction of the reorganized facial muscles in the trunk of elephants could likewise correspond with a specialization of neural control to mainly one hemisphere. As a consequence, the assumed diminished effort for motor control might lead to a more efficient feeding technique.

Thus, we hypothesized that elephants show side preferences in terms of significant differences between right- and left-directed performances in feeding-related trunk movements. To test this hypothesis, we measured (a) the twist direction of the trunk when grasping around a bundle of grass, (b) the mouth side toward which the trunk is moved, and (c) the side of the mouth from which the trunk is moved away.

On the basis of this hypothesis, we investigated the strength of side preferences in different trunk-movement categories. We also questioned possible benefits of side preferences. A reduction of the freedom of movements by one-sided specializations may imply a reduction in feeding techniques: Is this offset by any efficiency gains? For the evaluation of possible advantages of lateralization, the performance time of trunk movements offers a relevant measurement. If side preferences enhance fast trunk movements, the resulting increase of food intake would be an important benefit for elephants, which require large amounts of food.

Method

Recordings

During 5 weeks from July 1999 to August 1999, the trunk movements of 41 wild Asian elephants (*Elephas maximus*) were recorded while the elephants were feeding on grass in the Uda Walawe National Park of Sri Lanka. The park is situated in South Sri Lanka and encloses a 308-km^2 large area of former teak forest, open grassland, and thick bush vegetation. Large pools provide water for the elephants. Besides leaves, twigs, bark, and herbs from over 60 plant species (McKay, 1973), grasses like *Eragrostis*, *Eleusine*, *Cynodon*, and *Brachiaria* (Kurt, Reimers, & Schmidt, 2001) are the most extensively consumed food (Vancuylenberg, 1977). Approximately 90% of feeding time is spent on grasses during July and August (McKay, 1973).

During the daytime, herds as well as small male groups feed on the short grass in the valleys. Under these circumstances, the elephants could easily be recorded with a S-VHS video camcorder from the roof of a car between 6:00 a.m. and 9:30 a.m. and 3:00 p.m. and 6:30 p.m. The elephants were habituated to cars, which stayed on the park roads. Altogether, about 20 hr of video material were collected.

Subjects

Focal animals were recorded whenever they approached close enough to follow their distal trunk-part performances. The subjects were identified using printouts of their images from the videotape and divided into sex and age groups. The age groups—juveniles, subadults, and adults—were estimated according to the method of Kurt (1986) by the height of the animal. A total of 41 subjects was analyzed, 12 females (7 adults and 5 subadults) and 29 males (5 juveniles, 8 subadults, and 16 adults). The analysis was restricted to subjects showing more than 10 performances per a defined trunk-movement category. On average, each individual was recorded for 9.14 ± 4.37 min on 4.76 ± 2.84 separate feeding occasions, distributed over different days.

Procedure

According to the submovements established by Christel, Kitzel, and Niemitz (1998), three trunk-movement categories were defined: object contact, retrieval, and reaching. Object contact started with the trunk touching the food plant, included the food plant's manipulation, and ended as soon as the trunk pulled off the selected plant part. Retrieval was defined as the trunk's movement toward the mouth until the trunk tip touched it. Reaching described the trunk's movement away from the mouth until a new food plant was touched. In each of the trunk-movement categories, right- and left-side directions were distinguished. Object contact was classified as directed to the right if the distal part of the trunk laid down on its left side and twisted clockwise around the food plant. Correspondingly, left object contact was counted if the distal part of the trunk laid on its right side and twisted counterclockwise around the bundle of grass. In retrieval and reaching, the side of the mouth was recorded toward which the trunk was led (retrieval) or from which the trunk started to move away (reaching). Side-preference observations could be judged unambiguously independent of the angle in which the animal positioned itself in relation to the camera. Using "The Observer Video Analysis" software (Noldus Information Technology, 1997), we counted the right and left performances of object contact, retrieval, and reaching. Furthermore, the durations of each trunk-movement category, figured separately for right and left performances, were measured with a time resolution of 0.01 s. For each subject, at least 10 performances per categorized trunk movement were analyzed. Because the elephants repeated object contacts until they had collected a suitable portion of approximately 150 g (McKay, 1973), object contact was more often observed than reaching and retrieval. The measured trunk movements were interrupted by other performances like cleaning the food portion, beating off flies, rolling a bundle of plants within the trunk hand, or scenting. Therefore, the three types of analyzed trunk performances were considered as independent movements. The database, made up of 400 min of video material, contained 3,048 object contacts, 815 actions of retrieval, and 847 reaching performances. For time analyses, the database provided 2,748 times for object contacts, 803 times for retrieval, and 836 times for reaching. If trunk performances were not clearly distinguishable as right or left because the trunk hand drew near the food or the mouth

medially, they were excluded from analysis: These performances made up less than 3% of the counts.

Analysis

Directions of side preferences were evaluated by counting the frequencies of right and left performances separately for each trunk-movement category and for each subject. The counts per individual, which had been taken on separate days, were pooled. Individual side preferences were tested with a binomial z score, allowing a significance level of $p < .05$. A chi-square test verified the population-level bias per trunk-movement category. For each subject, the combination of side-preference directions in object contact, retrieval, and reaching was determined. We falsified deviations of the observed distribution of side-preference combinations within the population from the expected equal distributions by applying the chi-square test.

The strength of side preferences in each trunk-movement category and each subject separately was quantified by the side index, $(R - L)/(R + L)$, where R is the number of right and L the number of left performances, a convention described by Bard, Hopkins, and Fort (1990). Ranging between 0 and 1, a high side index near 1 indicates a strong side preference, whereas a low side index near 0 marks a weak side preference including nonsignificant side biases. Negative side indices reflect left-side preferences, and positive side indices reflect right-side preferences. Regardless of right or left direction, the pure amounts of the side indices were used to compare the strength that occurred in different trunk-movement categories and age and sex groups. Statistical significance was tested using the Mann–Whitney U test.

To compare trunk-movement durations among sexes, age groups, movement categories, and directions of side preferences, we calculated the mean performance time of each individual. Significant differences were confirmed with the Mann–Whitney U test. The correlation between side index and mean duration of each trunk-movement category was made with Spearman's rank coefficient. In all statistical tests, a significance level of $p < .05$ was accepted.

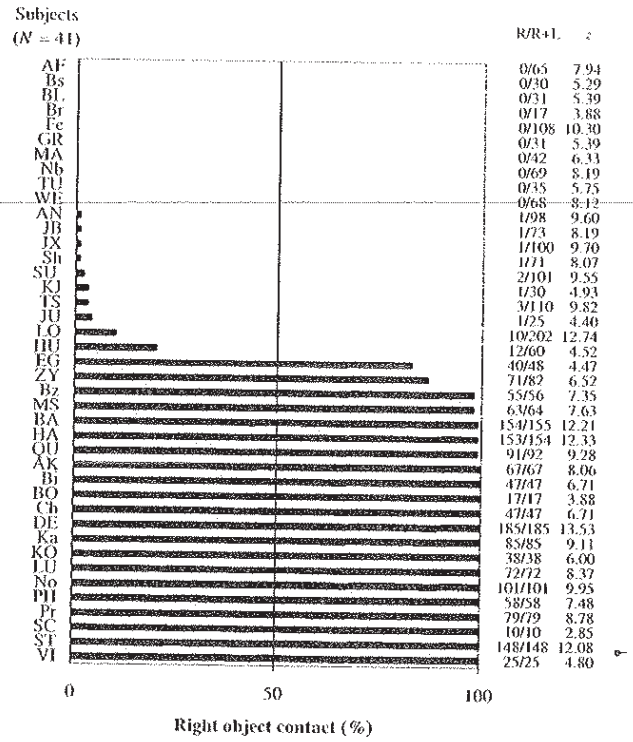

Figure 1. Percentage of right object-contact performances. Subjects indicated by two uppercase letters are males, and subjects indicated by one uppercase letter and one lowercase letter are females. All z scores are statistically significant (binomial test, $p < .05$). R = number of object contacts to the right; L = number of object contacts to the left.

Results

Directions of Side Preferences

All elephants showed side preferences in each of the three observed trunk-movement categories. In object contact, retrieval, and reaching, the distribution of individual right or left preferences was balanced; thus, no population-level bias occurred (chi-square, *ns*). Because the counts were pooled over separate days, the phenomenon of side preferences seems to be robust. Neither sex nor age had any influence on the direction of side preferences (chi-square, *ns*).

Each subject showed a highly significant side preference in object contact ($z > 2.85$, $p < .01$; see Figure 1). Out of 41 animals, 21 subjects (51%) favored the right side, whereas 20 subjects (49%) preferred the left side.

When retrieving food items, 27 subjects (66%) showed a significant mouth-side preference ($z > 2.02$, $p < .02$; see Figure 2). Among them, 17 individuals (63%) significantly preferred the right side ($z > 2.21$, $p < .02$), and 10 subjects (37%) frequented the left side more than predicted by chance ($z > 2.02$, $p < .04$). Of the remaining 14 subjects (44%), 7 (50%) tended to transport the food portion to the right side of the mouth, whereas 7 (50%) favored the left side of the mouth (binomial, *ns*).

In the case of reaching, 24 subjects (59%) significantly preferred one side ($z > 2.22$, $p < .02$; see Figure 3). Thirteen subjects (54%) started reaching from the right side of the mouth significantly more often ($z > 2.37$, $p < .02$), and 11 subjects (46%) started reaching from the left side significantly more often ($z > 2.03$, $p < .04$). In 17 elephants (41%), the preference for one side remained insignificant, and 1 of the adult males did not show a side preference at all. However, 9 subjects (53%) showed trends for the right and 7 (41%) for the left mouth side (binomial, *ns*).

For each subject, the combination of right or left side-preference directions in object contact, retrieval, and reaching was scored (see Figure 4). In the observed population, most of the possible combinations were represented, but the distribution of side-preference combinations differed significantly from the expected random distribution, $\chi^2(8, N = 41) = 39.1$, $p < .001$. More than half of the subjects ($N = 22$) preferred combinations with the same side preferences for object contact, retrieval, and reaching. This was completely independent from the side direction. Most subjects favoring different sides at least preferred the same side for reaching and retrieval.

Strength of Side Preferences

The strength of side preferences, quantified by the value of side indices, $|(R - L)/(R + L)|$, differed among the three trunk-movement categories. Table 1 shows that the highest side index was calculated for object contact. Retrieval as well as reaching was

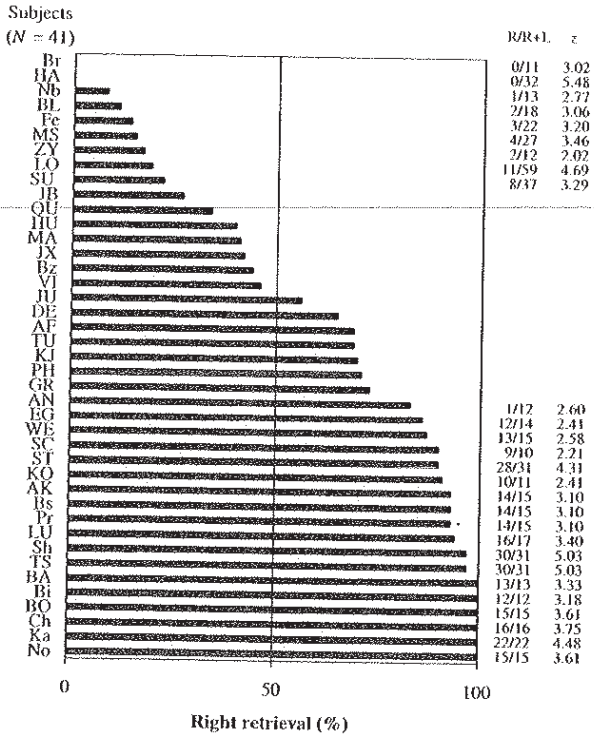

Figure 2. Percentage of right retrieval performances. Subjects indicated by two uppercase letters are males, and subjects indicated by one uppercase letter and one lowercase letter are females. Only statistically significant z scores are given (binomial test, $p < .05$). R = number of retrievals to the right; L = number of retrievals to the left.

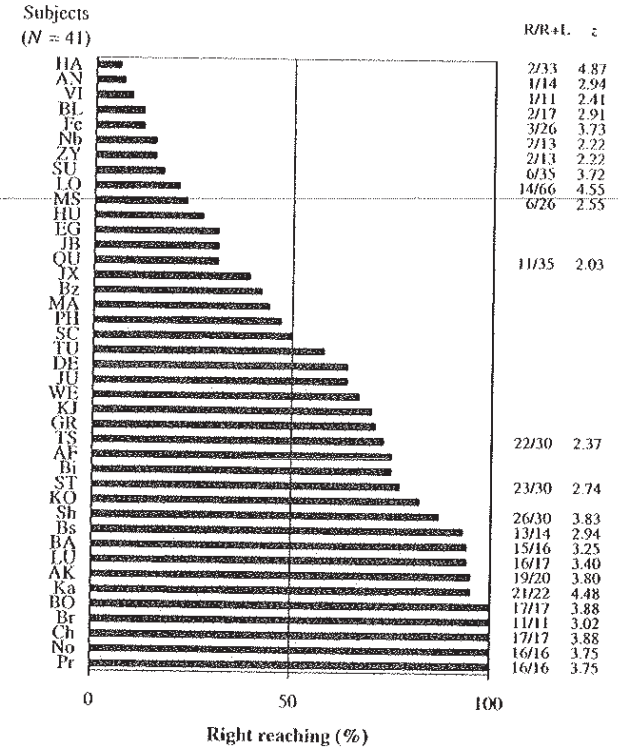

Figure 3. Percentage of right reaching performances. Subjects indicated by two uppercase letters are males, and subjects indicated by one uppercase letter and one lowercase letter are females. Only statistically significant z scores are given (binomial test, $p < .05$). R = number of reaches to the right; L = number of reaches to the left.

characterized by lower and more dispersed side indices. The side preference in object contact was significantly stronger than in retrieval ($U = 286$, $p < .005$) and reaching ($U = 185$, $p < .005$). In contrast, differences between reaching and retrieval remained insignificant (Mann–Whitney U, *ns*).

Subjects with right-side bias tended to show stronger side preferences than subjects favoring the left side. In the case of retrieval, the differences in the strength of left-side ($M = .55$, $SD = .31$) and right-side preference ($M = .74$, $SD = .27$) reached a significant level ($U = 123$, $p = .03$).

Comparing the side indices between the sexes (see Table 1), we found that females showed significantly stronger side preferences than males in retrieval ($U = 95$, $p = .02$) as well as in reaching ($U = 98$, $p = .03$). In object contact, the differences were nonsignificant (Mann–Whitney U, *ns*). Age groups did not differ significantly with regard to their side indices (Mann–Whitney U, *ns*).

Durations of Trunk Movements

The comparison of durations between the different trunk-movement categories gives basic information about the temporal dimensions needed for their performances. Mean movement durations lasted significantly longer in object contact ($M = 2.20$ s, $SD = 0.79$) than in retrieval ($M = 0.73$ s, $SD = 0.12$; $U = 0$, $p = .005$). Reaching took on average 0.58 s ($SD = 0.11$) and lasted significantly shorter than object contact ($U = 0$, $p < .005$) and retrieval ($U = 318$, $p = .005$). The performance time of the trunk movements did not differ significantly between the preferred and

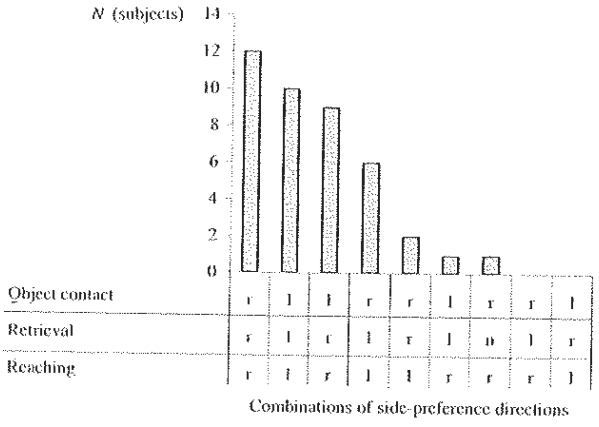

Figure 4. Distribution of the combinations of side-preference directions among the three trunk-movement categories—object contact, retrieval, and reaching—measured per individual ($N = 41$). r = right-side preference; l = left-side preference; n = no preference.

Table 1
Side Indices in Trunk-Movement Categories

	All subjects (N = 41)		Females (n = 12)		Males (n = 29)	
Trunk-movement category	*M*	*SD*	*M*	*SD*	*M*	*SD*
Object contact	.96	.09	.99	.01	.95	.10
Retrieval	.66	.30	.80	.32*	.60	.28*
Reaching	.59	.29	.74	.30*	.53	.27*

Note. The side index was calculated as $|(R - L)/(R + L)|$, where R is the number of right-side movements, and L is the number of left-side movements. Asterisks indicate significant differences (Mann–Whitney U, $p < .05$) between males and females.

the nonpreferred side in any of the subjects (Mann–Whitney U, *ns*).

In reaching and retrieval, a significant negative correlation was found between the side index value and the movement duration (see Figure 5). Subjects with a stronger side preference performed retrieval significantly faster than subjects with a weaker side bias ($r_s = -.37$, $p = .02$). The same correlation was calculated for reaching. By contrast, object contact durations did not correlate with side-preference degrees (Spearman's rank coefficient, *ns*).

Discussion

In this study, the observed wild Asian elephants showed individual side preferences in feeding-related trunk movements. All subjects twisted their trunks significantly either to the right or to the left around food plants (object contact). Therefore, we distinguish the elephants as "right-trunkers" and "left-trunkers." Obviously, the vertical orientation of the grass predetermines the trunk to twist laterally around it. Perhaps, the choice for one side is triggered by eye preferences and related regions of the cortex relevant to visuospatial movement control: Visual control of food manipulation is possibly restricted to the eye not hidden by the trunk. Although visual-learning experiments by Rensch and Altevogt (1953) with captive elephants seem to demonstrate their ability to monitor the trunk movements by visual cues, the experimental design might not have been representative for daily feeding conditions. Because of elephants' relatively small and laterally placed eyes with a narrow field of vision, visual control seems unlikely to play a major part in daily food manipulation (Mariappa, 1986). The side preferences in object manipulations confirm previous findings in captive elephants feeding on leaves and bark (Martin, 2001). A detailed comparison of side preferences will follow elsewhere (Martin, 2003). Because the side preferences remained constant on separate days, the phenomenon is not restricted to single occasions.

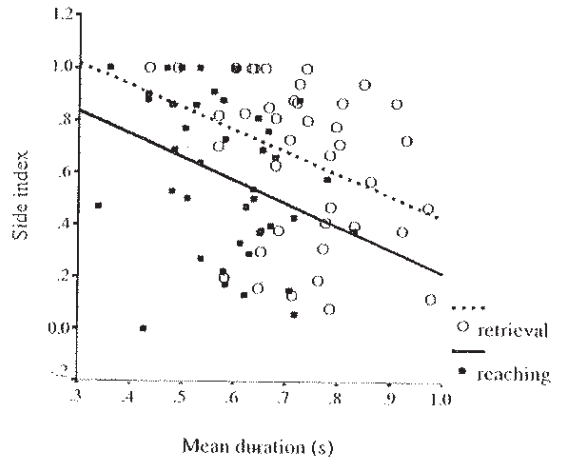

Figure 5. Correlation between the side index and the mean duration (in seconds) of the trunk-movement categories reaching and retrieval (N = 41). A high side index indicates a strong side preference. The durations of both actions decrease significantly with an increasing side index (Spearman's rank coefficient, $p < .05$). The dashed and solid lines show the regression line for retrieval and reaching, respectively, calculated by SPSS statistics. For reaching, $r_s = -.37$, $p = .02$. For retrieval, $r_s = -.37$, $p = .02$.

A comparable twist-side preference in another unpaired grasping organ has been reported for the prehensile tail of spider monkeys. Predominantly used as a fifth extremity in locomotion, the prehensile part of the tail preferably twists to one side when grasping around the supporting substrate (Dittwald, Matzke, Martin, & Niemitz, 2002). To the best of our knowledge, nothing has been published about comparable laterality in further unpaired grasping organs, for example, the prehensile tails of opossums, kinkajous, and platyrrhine monkeys, or in trunklike organs such as the tapir nose and upper lip of several herbivores. As examples of other unpaired organs involved in feeding, the tongues of some amphibians and reptiles should be mentioned. They generally protrude medially toward the prey, which adheres to the sticky surface of the tongue (Bels, Chardon, & Kardong, 1994; Lauder & Reilly, 1994). Chameleons envelop their prey with the tip of their tongue instead of twisting it around the kill (Herrel, Meyers, Aerts, & Nishikawa, 2000). In mammals, Doran (1975) classified the tongues in intra- and extraoral types. Ant-eating animals like *Tachyglossus, Tarsipes*, and *Manis* possess an extraoral tongue, which is innervated by a single midline nerve. It is protruded toward the prey organisms, which adhere to its surface. Thus, there seems to be no need for side preferences in these tongues. In contrast, the intraoral tongue characteristic of most mammals is bilaterally innervated by both the hypoglossal and lingual nerve. Especially herbivores are able to twist their tongues around the food plant (Hiiemae, 2000), but we do not know of any study about side preferences referring to this issue.

More than half of the elephants significantly preferred one side of the mouth toward which the trunk was moved (retrieval) or from which the trunk was shifted away (reaching). Side preferences for retrieval have already been mentioned for wild elephants in India and Sri Lanka by Kurt (1986), who identified individuals as *right-feeders* and *left-feeders* (translated from German) but did not quantify any lateral bias. Because all elephants of the present study demonstrated side preferences in object contact but only half of them in retrieval and reaching, the terms *right-trunkers* and *left-trunkers* might be more accurate.

The functional asymmetry of facial muscles like that observed for the trunk might be similar to the facial asymmetries investigated in primates, which lead to different emotional expressions (Fernandez-Carriba et al., 2002) and mouth shapes in vocalization (Hook-Costigan & Rogers, 1998). When feeding, marmosets also show a significant mouth-side preference depending on the hand that is preferred to hold the food item (Hook-Costigan & Rogers, 1995). Elephants, of course, have no choice between two grasping extremities. Instead, the technique used to uncoil the trunk hand to place the food portion on the tongue perhaps influences the decision of which mouth side to choose. Longer blades of grass hanging out right or left of the trunk hand probably led to variations of the applied technique. Overall, it may explain why several elephants did not show significant side preferences but a trend toward one side.

A further example of body-side preference is reported by Laska (1998) for captive spider monkeys, which move their tails exclusively to one side of the body's midline to fish for food outside of their hand reach. During positional behavior, the tail is preferably laid around one side of the body (Laska & Tutsch, 2000). It seems that functional preferences toward one side are advantageous even in an unpaired, anatomically symmetric organized grasping organ, which, at first sight, seems not to have a right or left option.

The functional asymmetries demonstrated in the unpaired organs might reflect a hemispheric asymmetry. In the cortex of spider monkeys, specific somatosensory and motor representations of the tail are considerably enlarged compared with *Catarrhini* without a prehensile tail or to genera with a less extensively used grasping tail like *Cebus* (Fulton & Dusser De Barènne, 1933). This suggests an elaborate neural control of the grasping organ. Laska (1998) assumed that functional asymmetries reflect the enlarged cortical areas of the corresponding hemisphere. Similar explanations are discussed for mouth (Hook-Costigan & Rogers, 1995, 1998) and facial asymmetries (Fernandez-Carriba et al., 2002).

The functional asymmetries of the anatomically symmetric trunk, reflected as side preferences, might indicate an anatomical asymmetry of the elephant's brain hemispheres, comparable with brain asymmetries described for other vertebrates (Bradshaw, 1989; Hopkins & Pilcher, 2001; Witelson, 1977). In elephants, neither has the representation of the trunk in the motor cortex been investigated sufficiently (Cozzi et al., 2001; Haug, 1970) nor has anything been mentioned about anatomical asymmetries of the brain. The cortex is highly structured with a folding index, which even exceeds the human one (Haug, 1969). A large amount of extra cortical tissue is reserved for complex multimodal or higher order brain functions (Hofman, 1982). Cytoarchitectural differences in the cortex of the elephant indicate distinct cortical areas, although nothing is known about the precise location of their functions (Haug, 1966). Haug (1970) assumed that the large cerebellum mainly controls the trunk. However, the side preferences of trunk movements support the idea of a dominant neocortical influence on movement control.

The lateral preference in trunk movements was restricted to the individual level. A population-level bias was not found. This ranges the trunk-side preferences in elephants among the paw preferences found in rats, mice, and cats (e.g., Bisazza, Rogers, & Vallortigara, 1998; Walker, 1980); the hand preferences found in most of the investigated nonhuman primates (e.g., McGrew & Marchant, 1996, 1997a, 2001); and the side preferences in the grasping tail of *Ateles* performed during locomotion (Dittwald et al., 2002) and resting behavior (Laska & Tutsch, 2000). According to the lateral preference levels established for primates by McGrew and Marchant (1997b), wild Asian elephants fit between Level 2 for the trunk movements retrieval and reaching and Level 3 for object contact. Individual side preferences may have to be interpreted as mere adaptations that individuals gained through experience, without an evolutionary significance (Denenberg, 1981). However, other authors (Levy, 1977; Rogers, 2000) have stressed the evolutionary importance of lateralization because of its option to increase efficiency in brain functions. As long as enough individuals of a population show a significant side preference, the direction of that side preference might remain irrelevant (Rogers, 1989).

The differences between strong side preferences in object contact and weaker side preferences in retrieval and reaching led us to two deductions. First, following the model for motor scheme, which includes the spatial and temporal organization of reach-to-grasp movements in humans (Christel et al., 1998; Jeannerod, 1984), the trunk-movement categories retrieval and reaching represent transport components and should be distinguished in their function from object contact as a manipulative submovement. Second, the manipulation of food objects seems to be a more complex task with higher cognitive demands than the transport components retrieval and reaching. Obviously, the manipulation components enhance a higher degree of specialization toward one side. These results are consistent with the positive correlation between task complexity and hand preferences found in primates (Beck & Barton, 1972; Byrne & Byrne, 1991; Byrne, Corp, & Byrne, 2001; Fagot & Vauclair, 1988, 1991; Hopkins et al., 2002; Parnell, 2001). Moreover, these findings support Byrne et al.'s (2001) idea to use lateral specialization as a measure of cognitive complexity. However, in captive chimpanzees multiple measures of hand use showed population-level right-handedness, which suggests multidimensional rather than task-specific laterality (Wesley et al., 2002).

These interpretations are supported by the similarities between the transport components regarding the directions of side preferences. More than half of the subjects favored the same direction of side preference in object contact, retrieval, and reaching. Only 19 elephants preferred different sides. In these cases, at least the transport components, reaching and retrieval, generally showed the same direction. It seems obvious that if the trunk is retrieved to one side, the next reach in terms of efficiency should start from the same side. However, occasionally the food portion was adjusted or manipulated further by the trunk inside the mouth. This offered the option to change from one to the other side of the mouth. One could argue that elephants, which have a continuous second dentition of their molars, prefer that mouth side with the optimal

molars to chew the food with. However, the transport of food portions to the molars is taken over by the tongue, which receives the food medially from the trunk.

Elephants showed stronger side preferences in their trunk movements when compared with the degrees of hand preferences in primates calculated from published data (Byrne et al., 2001; McGrew & Marchant, 1996, 2001; Parnell, 2001). In wild chimpanzees, side indices ranged between .07 and .37 for simple reaching for food but increased to .91 when fishing termites or hammering with a stone to crack nuts (McGrew & Marchant, 1996, 2001). For gorillas, side indices of about .89 were reported for complex leaf gathering (Byrne & Byrne, 1991). In captive chimpanzees, a handedness index of .03–.23 has been reported for different tasks (Wesley et al., 2002). The degree of side preferences for object manipulation in the unpaired grasping organ of elephants achieved with a side index of .95–.99 a level comparable with tool-use behavior in wild chimpanzees or complex leaf-gathering in wild gorillas. Reaching and retrieval in elephant trunks achieved even stronger side preferences than comparable arm movements in apes. This stresses the necessity to specialize cognitively demanding motor control toward one side. In relation to the strength of twist-side preferences of about .49 found in the grasping tail of spider monkeys during locomotion, the trunk shows a stronger specialization toward one side. Probably, the uniformly oriented grass facilitates a side preference in trunk performances more than the complex oriented substrate in the upper canopy relevant for the prehensile tail.

In performance differences between the sexes, females showed stronger side preferences than males, which achieved significance in retrieval and reaching. Similar findings are known for wild gorillas (Byrne & Byrne, 1991; Parnell, 2001). Females seem to have a greater advantage by automatizing their feeding movements toward one side than males do. Unlike males, females live in groups and have to focus a considerable amount of their attention on offspring (McKay, 1973). Probably, they more consistently use the ability to develop a routine in more simple motor programs like retrieval and reaching by restricting these movements toward one side.

The degree of side preference did not differ significantly between the age groups. Investigations in primates revealed an increasing side-preference degree with increasing age, which is interpreted with the ontogenetic differentiation of hemispheres (Hook & Rogers, 2000; Hopkins & Bard, 1993, 2000). Accordingly, we would have expected an age-corresponding increase of the strength of trunk-side preferences. Probably, the development of side preferences in trunk performances is restricted to a narrow time window and already occurs in neonates (up to 2 years), which begin to explore food (Martin, 2001).

Side-preference benefits have been quantified for wild gorillas and chimpanzees; animals with stronger manual laterality feed more rapidly (Byrne & Byrne, 1991; McGrew & Marchant, 1999). However, it is not possible to rule out the possibility that these effects are mediated by practice, and the underlying cause is differential experience. In this study, the performance time of each elephant's trunk movement was measured to characterize the benefits of side preferences. For a large herbivore like the elephant, which is dependent on large food consumption because of its poor digestion, faster performances of feeding-related trunk movements should increase fitness because they increase the amount of food intake. In fact, the results showed a significant negative correlation between side index and performance duration of retrieval and reaching. Strong side preferences in retrieval and reaching may increase the amount of food consumption provided that food portions remain constant. It can also be argued that maximizing the rate of food portions may lead to stronger side preferences. This needs to be confirmed by future studies. Also, the increase of food consumption due to side preferences needs to be investigated in view of long-term consequences on growth, weight, and reproduction success.

The advantages of one-sided specializations prevail the disadvantages of side preferences such as a reduction of freedom of movement in performance abilities. Perhaps, one-sided specializations enable the elephant to improve its manipulation skills to a large and qualified spectrum of highly precise movements on its preferred side even at the expense of the other side. This seems to be more efficient than maintaining more general both-sided performances.

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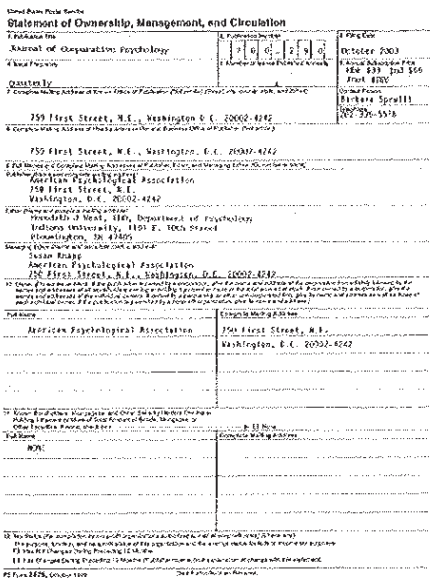
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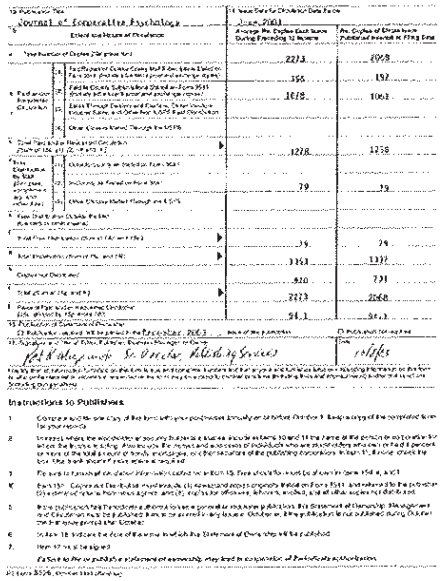
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Instructions to Publishers

Research

1st questions used – What causes Personality disorders?

- 6 magazines
- 6 articles
- 3 news.

2nd question asked – Borderline personality disorder.

- 76 magazines.
- 350 Journals / articles ← wanted peer reviewed so narrow it down. Also only wanted those where i could get full text and not too old & in english.
- 32 news.

3rd question asked – symptoms of BPD.

- 4 Articles.

Then to choose which articles I used i narrowed it down to peer reviewed articles.

I also used Psychcentral, BPD and BPDworld, to get general information about it. Through these sites I found out stuff about what it is, why it got it name, symptoms, characteristics and treatments used.

This is how i worked out which articles to read and make notes from. A03

• I've typed most of this up so it looks neater.

Dec 2009

Research

- I asked 2nd questions to do with nature vs nuture into gale datab they came out with.

1st. what causes personality disorder?

Came up with 15 results.

6 magazines
6 Articles
3 news

2nd. Borderline personality disorder

76 magazines
630-350 Journals - ~~159 full text~~
32 news.

- After that i narrowed it down to peer reviewed.

- As well as that i also did a search for BPD symptoms on the database which came up with 4 results which were all articles.

- Also used Psychcentral, and BPDworld, as well as other sites which i put on my list.

- the reason i used them was to get things about what it is, how it got it name, symptoms, characteristics & treatments

- i found this hard to do as out of the information i found, most of it was either not relevant or wasn't a suitable source of information such as wasn't

Jan 2009/10

- out of my research i choose about 20 articles both journals + internet to help me with writing the essay.

- I choose this because they relate to my question.

- After i did that i got a highlighter and highlighted the bits in the articles which i want to use.

- The journals articles were the hardest to understand some words, but i kept a dictionary next to me, so that i could check any words i didn't know.

- also when trying to use athens, i couldn't find what i was looking for as kept coming up with random arti or i could only get abstracts and no

Feb 2010

- have now started to write essay.
- I have decided that instead of starting at the beginning with BPD, I will do a short introduction to Personality disorders as a whole and why I choose BPD to do instead of any others.
- The essay will then go to talk about BPD in general - which is where I am at the moment.
- I hope to finish this essay in April / May time.

April 2010

- now just doing changes to the essay. but have basically ~~changed~~ finished it.

- Been looking for info about DSM+ ICD in books to add to my essay.

- made sure that all my articles used to are peer reviewed, as that means that they will be more reliable than if they weren't.

- found new studies for the prognosis bit of the essay.

after talking to my supervisor, they suggested that i should look for more research on DSM+ ICD so to make my essay better.

- This was difficult to do, as there was not much info available on DSM+ ICD, and the stuff that i did find wasn't

March 2010

- just started adding in studies for both sides of argument, and then at the end of the essay i wanted to finish off with a conclusio

- putting in more details such as prognosis, and things about ~~B~~ Bi polar.

- doing lots of different drafts - only about my 3rd or 4th draft.

- i am still hoping to finish everything around April / May time

- put in titles for each section.

http://en.wikipedia.org/wiki/Personality_disorder

Types of disorders

- Schizoid personality disorder
- Paranoid personality disorder – characterised by excessive distrust and suspiciousious of others.
- Schizotypal personality disorder
- Antisocial personality disorder – May be going to be called antisocial / psychopathic type
- Borderline personality disorder / may be going to borderline type in the new DSM VI
- Histrionic personality disorder
- Narcissistic personality disorder
- Avoidant personality disorder – maybe going to be called avoidant type
- Dependant personality disorder
- Obsessive compulsive disorder – obsessive compulsive type

http://www.mentalhealth.com/dis/p20-pe01.html

http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=140

http://www.rcpsych.ac.uk/mentalhealthinformation/mentalhealthproblems/personalitydisorders/pd.aspx - good site for anything to do with personality disorders.

http://www.nimh.nih.gov/health/publications/borderline-personality-disorder-fact-sheet/index.shtml

http://ajp.psychiatryonline.org/cgi/content/abstract/166/12/1365

http://bjp.rcpsych.org/cgi/content/full/190/49/s51?#SEC2

http://www.bpdworld.org/leaflets-a-downloads - Leaflet on BPD

http://www.bpdworld.org/leaflets-a-downloads - Leaflet on DBT – dialectal behaviour therapy.

http://www.bpdworld.org/leaflets-a-downloads - Leaflet on how to cope if you have BPD

http://apt.rcpsych.org/cgi/content/full/6/3/211 - info on BPD and stats about how many get it.

http://bpd.about.com/od/causesofbpd/a/CausesBPD.htm Causes of BPD

http://www.sciencedaily.com/releases/2008/12/081216114100.htm - genetics - BPD

http://www.sciencedaily.com/releases/2008/08/080807144305.htm - brain- BPD

http://www.sciencedaily.com/releases/2007/12/071221094757.htm - Brain - BPD

http://www.aaets.org/article20.htm - genetics

http://ajp.psychiatryonline.org/cgi/content/full/164/12/1776 - brain

I have chosen to do borderline personality disorder for my essay as it is the only one which I can find a range of different information on.

Articles I want to use

- **Neurocognitive impairment in borderline personality disorder?(CATEGORY 1)(Disease/Disorder overview)**

LeGris, Jeannette, and Rob van Reekum. "Neurocognitive impairment in borderline personality disorder?" *Psychiatric Times* 25.1 (2008): 66. *General OneFile.* Web. 12 Mar. 2010.

- **What's in a Name?(Borderline personality disorder)**

"What's in a Name?(Borderline personality disorder)." *Psychiatric Times* 22.2 (2005): 16. *General OneFile.* Web. 12 Mar. 2010.

- **Trauma reenactment: rethinking borderline personality disorder when diagnosing sexual abuse survivors.**

Trippany, Robyn L., Heather M. Helm, and Laura Simpson. "Trauma reenactment: rethinking borderline personality disorder when diagnosing sexual abuse survivors." *Journal of Mental Health Counseling* 28.2 (2006): 95+. *General OneFile.* Web. 12 Mar. 2010.

- **Reduced amygdala and hippocampus size in trauma-exposed women with borderline personality disorder and without posttraumatic stress disorder.(Brief Report)(Report)**

Weniger, Godehard, et al. "Reduced amygdala and hippocampus size in trauma-exposed women with borderline personality disorder and without posttraumatic stress disorder." *Journal of Psychiatry and Neuroscience* 34.5 (2009): 383+. *General OneFile.* Web. 12 Mar. 2010.

- **Relationship of childhood sexual abuse to borderline personality disorder, posttraumatic stress disorder, and multiple personality disorder.**

Murray, John B. "Relationship of childhood sexual abuse to borderline personality disorder, posttraumatic stress disorder, and multiple personality disorder." *The Journal of Psychology* 127.6 (1993): 657+. *General OneFile.* Web. 12 Mar. 2010.

- **Substance use disorders and Cluster B personality disorders: physiological, cognitive, and environmental correlates in a college sample.**

Taylor, Jeanette. "Substance use disorders and Cluster B personality disorders: physiological, cognitive, and environmental correlates in a college sample." *American Journal of Drug and Alcohol Abuse* 31.3 (2005): 515+. *General OneFile.* Web. 12 Mar. 2010.

- **Corpus callosum abnormalities in women with borderline personality disorder and comorbid attention-deficit hyperactivity disorder.(Research Paper/Article de recherche)**

Rusch, Nicolas, et al. "Corpus callosum abnormalities in women with borderline personality disorder and comorbid attention-deficit hyperactivity disorder." *Journal of Psychiatry and Neuroscience* 32.6 (2007): 417+. *General OneFile.* Web. 12 Mar. 2010.

- **NMDA neurotransmission as a critical mediator of borderline personality disorder.(psychiatric research)(Introduction also in French)(includes tables)**

Grosjean, Bernadette, and Guochuan E. Tsai. "NMDA neurotransmission as a critical mediator of borderline personality disorder." *Journal of Psychiatry and Neuroscience* 32.2 (2007): 103+. *General OneFile.* Web. 12 Mar. 2010.

- **Borderline personality symptoms and human immunodeficiency virus risk in alcohol and other drug abusing adolescent offenders.(Report)**

Devieux, Jessy G., et al. "Borderline personality symptoms and human immunodeficiency virus risk in alcohol and other drug abusing adolescent offenders." *American Journal of Infectious Diseases* 5.1 (2009): 31+. *General OneFile*. Web. 12 Mar. 2010.

- **Developmental personality styles: an attachment theory conceptualization of personality disorders. (Practice & Theory).**

Lyddon, William J., and Alissa Sherry. "Developmental personality styles: an attachment theory conceptualization of personality disorders. (Practice & Theory)." *Journal of Counseling and Development* 79.4 (2001): 405+. *General OneFile*. Web. 12 Mar. 2010

- **[I-123] ADAM and SPECT in patients with borderline personality disorder and healthy control subjects.(Research Paper)(2-([2-([dimethylamino]methyl)phenyl]thio; single photon emission computed tomography)**

Koch, Walter, et al. "[I-123] ADAM and SPECT in patients with borderline personality disorder and healthy control subjects." *Journal of Psychiatry and Neuroscience* 32.4 (2007): 234+. *General OneFile*. Web. 12 Mar. 2010.

- **Hippocampus and amygdala volumes in patients with borderline personality disorder with or without posttraumatic stress disorder.(Research Paper)(Report)**

Schmahl, Christian, et al. "Hippocampus and amygdala volumes in patients with borderline personality disorder with or without posttraumatic stress disorder." *Journal of Psychiatry and Neuroscience* 34.4 (2009): 289+. *General OneFile*. Web. 12 Mar. 2010.

- **New Knowledge & New Conceptions.(Borderline personality disorder)**

Gunderson, John. "New Knowledge & New Conceptions.(Borderline personality disorder)." *Psychiatric Times* 21.8 (2004): 41. *General OneFile*. Web. 12 Mar. 2010.

- **Borderline Personality Disorder: An Overview.**

Oldham, John M. "Borderline Personality Disorder: An Overview." *Psychiatric Times* 21.8 (2004): 43. *General OneFile*. Web. 12 Mar. 2010.

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Academic Journals (23 saved items) DocumentType

Title:"Missing links" in borderline personality disorder: loss of neural synchrony relates to lack of emotion regulation and impulse control.(Research Paper/Article de recherche)(psychiatric research)

Pub:*Journal of Psychiatry and Neuroscience*

Detail: Leanne M. Williams, Anna Sidis, Evian Gordon and Russell A. Meares. 31.3 (May 2006): p181(8). (6254 words)

Article

Title:[I-123] ADAM and SPECT in patients with borderline personality disorder and healthy control subjects.(Research Paper)(2-([2-([dimethylamino]methyl)phenyl]thio; single photon emission computed tomography)
Pub:*Journal of Psychiatry and Neuroscience*
Detail: Walter Koch, Nadine Schaaff, Gabriele Popperl, Christoph Mulert, Georg Juckel, Markus Reicherzer, Christoff Ehmer-von Geiso, Hans-Jurgen Moller, Ulrich Hegerl, Klaus Tatsch and Oliver Pogarell. 32.4 (July 2007): p234(7). (5327 words)

Article

Title:Borderline Personality Disorder.
Pub:*Psychiatric Times*
Detail:22.7 (June 1, 2005): p13. (399 words)

Article

Title:Borderline Personality Disorder: An Overview.
Pub:*Psychiatric Times*
Detail: John M. Oldham. 21.8 (July 1, 2004): p43. (2843 words)

Article

Title:Borderline personality symptoms and human immunodeficiency virus risk in alcohol and other drug abusing adolescent offenders.(Report)
Pub:*American Journal of Infectious Diseases*
Detail: Jessy G. Devieux, Robert M. Malow, Rhonda Rosenberg, Madhavan Nair, Deanne M. Samuels and Robert McMahon. 5.1 (Jan 2009): p31(9). (6084 words)

Report

Title:Corpus callosum abnormalities in women with borderline personality disorder and comorbid attention-deficit hyperactivity disorder.(Research Paper/Article de recherche)
Pub:*Journal of Psychiatry and Neuroscience*
Detail: Nicolas Rusch, Eileen Luders, Klaus Lieb, Roland Zahn, Dieter Ebert, Paul M. Thompson, Arthur W. Toga and Ludger Tebartz van Elst. 32.6 (Nov 2007): p417(6). (4533 words)

Article

Title:Developmental personality styles: an attachment theory conceptualization of personality disorders. (Practice & Theory).
Pub:*Journal of Counseling and Development*
Detail: William J. Lyddon and Alissa Sherry. 79.4 (Fall 2001): p405(10). (8109 words)

Article

Title:Exploring the Link Between Conduct Disorder in Adolescence and Personality Disorders in Adulthood.(research)
Pub:*Psychiatric Times*
Detail: Ellen Kjelsberg. 23.8 (July 1, 2006): p22. (2870 words)

Article

Title:Hippocampus and amygdala volumes in patients with borderline personality disorder with or without posttraumatic stress disorder.(Research Paper)(Report)
Pub:*Journal of Psychiatry and Neuroscience*
Detail: Christian Schmahl, Kevin Berne, Annegret Krause, Nikolaus Kleindienst, Gabriele Valerius, Eric Vermetten and Martin Bohus. 34.4 (July 2009): p289(7). (5169 words)

Report

Title:Male-female response profile differences on the WAIS-R in clients suffering from borderline personality disorders.
Pub:*The Journal of Psychology*
Detail: Evans Mandes and Julie Kellin. 127.n5 (Sept 1993): pp565(8). (2647 words)

Article

Title:Neurocognitive impairment in borderline personality disorder?(CATEGORY 1)(Disease/Disorder overview)
Pub:*Psychiatric Times*
Detail: Jeannette LeGris and Rob van Reekum. 25.1 (Jan 2008): p66. (5456 words)

Disease/Disorder overview

Title:Neuroimaging and genetics of borderline personality disorder: a review.(Disease/Disorder overview)
Pub:*Journal of Psychiatry and Neuroscience*

Detail: Eric Lis, Brian Greenfield, Melissa Henry, Jean Marc Guile and Geoffrey Dougherty. 32.3 (May 2007): p162(12). (10612 words)

Disease/Disorder overview

Title:New Knowledge & New Conceptions.(Borderline personality disorder)
Pub:*Psychiatric Times*
Detail: John Gunderson. 21.8 (July 1, 2004): p41. (667 words)

Article

Title:NMDA neurotransmission as a critical mediator of borderline personality disorder.(psychiatric research)(Introduction also in French)(includes tables)
Pub:*Journal of Psychiatry and Neuroscience*
Detail: Bernadette Grosjean and Guochuan E. Tsai. 32.2 (March 2007): p103(13). (11266 words)

Article

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A02

examples of background reading.

Science News

Possible Genetic Causes Of Borderline Personality Disorder Identified

ScienceDaily (Dec. 20, 2008) — According to the National Institute of Mental Health, borderline personality disorder (BPD) is more common than schizophrenia or bipolar disorder and is estimated to affect 2 percent of the population. In a new study, a University of Missouri researcher and Dutch team of research collaborators found that genetic material on chromosome nine was linked to BPD features, a disorder characterized by pervasive instability in moods, interpersonal relationships, self-image and behavior, and can lead to suicidal behavior, substance abuse and failed relationships.

See Also:

Health & Medicine
- Personalized Medicine
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- Gene Therapy

Mind & Brain
- Borderline Personality Disorder
- Social Psychology
- Psychiatry

Reference
- Personality disorder
- Trait (biology)
- Twin
- Narcissistic personality disorder

"The results of this study hopefully will bring researchers closer to determining the genetic causes of BPD and may have important implications for treatment programs in the future," said Timothy Trull, professor of psychology in the MU College of Arts and Science. "Localizing and identifying the genes that influence the development of BPD will not only be important for scientific purposes, but will also have clinical implications."

In an ongoing study of the health and lifestyles of families with twins in the Netherlands, Trull and colleagues examined 711 pairs of siblings and 561 parents to identify the location of genetic traits that influences the manifestation of BPD. The researchers conducted a genetic linkage analysis of the families and identified chromosomal regions that could contain genes that influence the development of BPD. Trull found the strongest evidence for a genetic influence on BPD features on chromosome nine.

In a previous study, Trull and research colleagues examined data from 5,496 twins in the Netherlands, Belgium and Australia to assess the extent of genetic influence on the manifestation of BPD features. The research team found that 42 percent of variation in BPD features was attributable to genetic influences and 58 percent was attributable to environmental influences, and this was consistent across the three countries. In addition, Trull and colleagues found that there was no significant difference in heritability rates between men and women, and that young adults displayed more BPD features then older adults.

"We were able to provide precise estimates of the genetic influence on BPD features, test for differences between the sexes, and determine if our estimates were consistent across three different countries," Trull said. "Our results suggest that genetic factors play a major role in individual differences of borderline personality disorder features in Western society."

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Adapted from materials provided by University of Missouri-Columbia.

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1. Distel et al. **Chromosome 9: linkage for borderline personality disorder features.** *Psychiatric Genetics*, 2008; 18 (6): 302 DOI: 10.1097/YPG.0b013e3283118468
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MU Researcher Identifies Possible Genetic Causes Of Borderline Personality Disorder

Main Category: Mental Health
Also Included In: Genetics
Article Date: 18 Dec 2008 - 2:00 PDT

According to the National Institute of Mental Health, borderline personality disorder (BPD) is more common than schizophrenia or bipolar disorder and is estimated to affect 2 percent of the population. In a new study, a University of Missouri researcher and Dutch team of research collaborators found that genetic material on chromosome nine was linked to BPD features, a disorder characterized by pervasive instability in moods, interpersonal relationships, self-image and behavior, and can lead to suicidal behavior, substance abuse and failed relationships.

"The results of this study hopefully will bring researchers closer to determining the genetic causes of BPD and may have important implications for treatment programs in the future," said Timothy Trull, professor of psychology in the MU College of Arts and Science. "Localizing and identifying the genes that influence the development of BPD will not only be important for scientific purposes, but will also have clinical implications."

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Notes:

Trull's study, "Chromosome 9: linkage for borderline personality disorder" was recently published in Psychiatric Genetics and "Heritability of borderline personality disorder features is similar across three countries" was published in Psychological Medicine.

Source:
Jeffrey Beeson
University of Missouri-Columbia

Neurocognitive impairment in borderline personality disorder?(CATEGORY 1)(Disease/Disorder overview)

LeGris, Jeannette, and Rob van Reekum. "Neurocognitive impairment in borderline personality disorder?" *Psychiatric Times* 25.1 (2008): 66. *General OneFile*. Web. 12 Mar. 2010.
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Borderline personality disorder (BPD) has been described as bordering on 3 DSM classifications: schizophrenia and the psychoses, mood disorders, and impulse control disorders. (1) Recent interest in a potential "fourth border" is emerging with examination of the relationships between the brain and BPD. While many multifaceted pathways and models to BPD are currently hypothesized, little is definitively known and clinically recognized about the neurocognitive vulnerabilities and impairments associated with BPD that may influence symptom onset, poor treatment response, and the challenges experienced in daily living. While clinical treatments tend to favor the psychosocial correlates of BPD (ie, abuse, trauma, neglect) and these remain the focus of many psychotherapeutic interventions, the role of neurocognitive impairment in the development, chronicity, and treatment resistance of the disorder is not well understood.

Many studies have looked at correlations between brain injury, neurological changes, and BPD. Although cause-effect relationships have been difficult to establish, future research may clarify these relationships and lead clinicians to a better understanding of the neurological underpinnings of behaviors in patients with BPD.

CASE VIGNETTE

John, a 23-year-old, was brought to the emergency department following an intentional overdose. With a 3-year history of mood lability, anger dyscontrol, and impulsivity involving substance abuse, intense short-lived relationships, and increasing suicidal behavior, BPD was diagnosed following the exclusion of mood disorder and psychotic illness. He had been in a motor vehicle accident 4 years earlier and had had a moderate traumatic brain injury with no obvious motor, sensory, or neurological sequelae. Deficits in attentional and executive functions had been noted over time along with affective lability and behavioral disinhibition. The patient did not respond to typical treatment for BPD.

Because BPD has historically been considered a single disorder, treatments have tended to be unitary in dimension. As evidence emerges that BPD may arise from multiple sources ending in a final common pathway of personality disturbance, it may be helpful to reconceptualize BPD as a syndrome of affects, behaviors, and cognitions whose variable causes and vulnerabilities require more integrated models of treatment and research. Disorders of the brain, including neurodevelopmental and acquired CNS insults, need to be examined more systematically for their potential causal roles in psychiatric personality disturbance.

The current DSM classification of BPD excludes origins that are attributable to a general physiological or medical condition. However, there is growing evidence that BPD is associated with high rates of developmental (eg, attention-deficit/hyperactivity disorder [ADHD], learning

disabilities) and acquired CNS insults. (2-9) These underlying comorbidities frequently go unrecognized and may contribute to the feelings commonly experienced by patients with BPD as being misunderstood or undervalued. For example, patients with BPD are often viewed as being manipulative; however, it may be that certain types of cognitive impairment (eg, reasoning, planning, problem solving, foresight, and insight) may result in less sophisticated attempts to manage their worlds and hence their behavior may be more likely to be misperceived. Missing the significance of these comorbidities may further contribute to limited assessment, missed opportunities for intervention, and ultimate treatment failure, and finally to greater social and economic burden.

BRAIN INJURY AND BPD

Evidence needed to establish a causal relationship

Consistent associations between disturbances in brain function and BPD continue to emerge, particularly those that involve executive or frontal lobe function. (20) These findings raise the question of whether individuals with BPD have an underlying disturbance in cerebral function. Hill's (11) criteria to support an argument for causation include:

* The presence of an association between causative agent(s) and the disorder (eg, an association between ADHD and/or traumatic brain injury and BPD).

* The correct temporal sequence (ie, brain injury/ insult must precede onset of BPD).

* The existence of a biologically plausible mechanism(s) underlying the causative agent.

* A biological gradient (eg, greater cerebral dysfunction resulting in greater BPD severity).

Analogous, consistent, and coherent evidence in addition to the specificity of the findings may further strengthen the arguments for causation.

Case-control studies

In one of the earliest works examining the precursors of BPD, Andrulonis and colleagues (2) studied 91 individuals with BPD and found that 56% of men and 29% of women in the study had a history of ADHD, learning disabilities, traumatic brain injury, encephalitis, or epilepsy, and this was significantly higher than rates in the schizophrenia and affective disorder control groups. Greater pregnancy complications in patients with BPD have been reported, (12,13) as well as neurodevelopmental (44%) or acquired (58%) brain insults. (3) The temporal sequence between these brain insults and the development of BPD cannot be determined from these retrospective data. In a subsequent investigation, 54% of patients with BPD were found to have had a developmental or acquired brain insult despite the CNS history exclusion criteria used in the study. (4) Brain injury scores measuring the number of brain insults correlated with scores on the diagnostic interview for borderline patients ($r = 0.47$), and the BPD and traumatic brain injury cognitive profiles were not different.

In a study based on patient history, electroencephalogram (EEG)/CT, or MRI, Zanarini and colleagues (14) examined the specificity of these findings. They found that 67.8% of patients with BPD compared with 62.7% of patients with other personality disorders had neurological dysfunctions, suggesting that brain pathology may not be specific to BPD and may be seen in other personality disorders. Lack of specificity does not weaken the argument that BPD may be caused, at least in some cases, by brain pathology, and indeed, there is some evidence for specificity. (5)

In a large, well-controlled study of all personality disorder clusters in comparison with healthy controls, Fossati and colleagues (5) found a strong association between a history of ADHD in childhood and adult BPD, compared with all other personality disorders. Their finding showed that 60% of patients with BPD had scores on the Wender Utah Rating Scale indicative of ADHD. We determined an odds ratio (OR) of over 20 for those with BPD (vs healthy controls) compared with a 1.7 OR for the other personality disorder clusters, including other non-BPD cluster B personality disorders, based on data from Fossati's study. These highly significant findings prevailed when antisocial personality disorder, sex, inpatient status, and Axis I comorbidities were statistically controlled for. The limitations of this study were the retrospective use of a single, broadly based but reliable measure for ADHD assessment.

Mendez and colleagues (15) examined 711 patients who had taken a medication overdose; 22 were found to have idiopathic epilepsy and this subgroup was matched to 44 controls from the same cohort on sex, age, and race. BPD was diagnosed in 45.5% of the epilepsy group compared with 13.6% in the control group.

Travers and King (7) compared the neuropsychological performance of systematically confirmed "organic" (traumatic brain injury, ADHD/learning disabilities, encephalitis, epilepsy) and "nonorganic" BPD patients with normal controls. In keeping with a biological gradient expectancy, the patients in the organic group performed more poorly than those in the nonorganic group on many of the neuropsychological measures. However, it was also found that the patients in the nonorganic group performed significantly worse than healthy controls on tests of simple and complex visual memory, visual perception, and logical verbal memory. These data support earlier consistent reports of similar cognitive deficits in BPD samples. Travers and King could not attribute this performance solely to the presence of a confirmed organic condition.

Follow-up studies of brain injury and BPD

Numerous studies report on neurobehavioral changes after a brain injury/insult/illness and are beyond the scope of this article. Briefly, frontal system brain injury, particularly injury involving the dorsolateral prefrontal cortex and orbitofrontal systems and their deeper connections, appears to be associated with the hallmarks of BPD (impulsivity, affective lability, anger dyscontrol, risky behavior, and suicide). Far fewer follow-up studies are available examining the temporal associations of brain insult and BPD diagnosis, and this requires further study.

Mathiesen and Weinryb (16) compared 13 adults after "sudden-onset brain injury involving prefrontal regions which preceded a personality change" with 65 healthy controls. The personality organization of the group with brain injury was "disturbed and close to a borderline organization," as measured by the Karolinska Psychodynamic Profile.

Case-control and follow-up data show relatively consistent and significant associations between brain insults/neurodevelopmental disorders and BPD symptoms. The methodological limitations of the studies to date constrain any firm conclusions, including the temporal direction or sequence of events. Note, however, that these rates of association may be conservative because most studies attempt to exclude patients with known histories of brain insult or trauma.

NEUROLOGICAL FINDINGS IN BPD

Nonlocalizing and nonspecific EEG abnormalities have been reported in studies of BPD, ranging from 13% to 59%. (13,17,11) The significance of these abnormalities is unclear. For example, Cornelius and colleagues (13) found that 13% of their BPD sample had EEG abnormalities compared with 9% in the mixed psychiatric control group. Another study found that auditory P300 latency was longer, with smaller amplitude in patients with BPD than in healthy controls or in those with

affective disorders or other personality disorders. P300 latencies and amplitudes were found to be similar in BPD and schizophrenia groups. (19) Gardner and colleagues (20) found 2 or more soft signs in approximately 60% of patients with BPD compared with 32% in healthy controls. Other studies confirmed the presence of soft signs in patients with BPD as well. (4,21)

Neuroimaging evidence

Volumetric brain studies have consistently found reductions in hippocampal and amygdala volumes in patients with BPD compared with healthy controls. (8,9,22-25) In addition to smaller hippocampi and amygdalae, Tebartz van Elst and colleagues (25) found reductions in the right anterior cingulate cortex. Reduced gray matter in the anterior and posterior cingulate has also been reported by Hazlett and colleagues. (26) Study findings suggest that these structural changes are the result of severe stress resulting from childhood psychological trauma (eg, abuse is commonly reported to have occurred in BPD patients between the ages of 2 and 7 years, an age span characterized by significant brain development). (8,9,23) Debate continues about whether these structural irregularities are caused by an overactive hypothalamic-pituitary-adrenal system or are genetically determined. Of interest are the findings that patients with posttraumatic stress disorder (PTSD) have similarly reduced hippocampi but do not demonstrate reduced amygdala volumes. (24)

Positron emission tomography scan findings have shown metabolic irregularities involving hypometabolism in the dorsolateral prefrontal and orbitofrontal cortices (27,28) and the hippocampus. (29) Goyer and colleagues (30) found reduced resting metabolism in the upper bilateral prefrontal cortex, as well as increased metabolism in the lower prefrontal areas. Three studies found reduced glucose metabolism in the orbitofrontal cortex and anterior cingulate gyrus of patients with BPD following fenfluramine challenge. (31-33) Low levels of serotonin in the prefrontal cortex and anterior cingulate cortex regions have been associated with increased aggression and deficient self-regulatory inhibition. Herpetz and colleagues (34) conducted functional MRI (fMRI) scans on 6 women with BPD and 6 matched healthy controls while they were viewing affectively aversive slides and found increased activation in the occipital and temporal regions of the participants who had BPD, as well as activation in fusiform gyri, amygdalae, and medial and lateral frontal cortices. These irregularities may contribute to the heightened emotional sensitivity and reactivity commonly experienced by many patients with this disorder.

Neuropsychological function and BPD

While there exists a well-recognized overlap in clinical symptoms and high psychiatric comorbidity in persons with BPD, traumatic brain injury sequelae, and adult ADHD, recent evidence suggests an additional overlap in areas of neuropsychological function in these individuals. Dysfunction in the executive or dorsolateral prefrontal areas of the brain is evident in BPD samples. (10) Executive functions involve goal-directed and task-oriented behaviors--areas in which patients with BPD, many of whom appear to have intact intellect, are particularly challenged. Executive dysfunction may be expressed through chronic underachievement, problems with employment, and volatile relationships. A characteristic inability to learn from one's previous errors despite a verbalized intent to do so is often paradoxical and puzzling to clinicians. Could disruptions in specific neurocognitive pathways localized to specific brain regions account for these and other poorly understood behaviors in persons with BPD?

O'Leary (35) undertook a review of 4 comprehensive studies that included 68 subjects with BPD. Impairments in simple and logical verbal memory, visuospatial organization, and complex visual memory were reported. These studies excluded persons with current or past Axis I comorbidities and half of these studies also reported deficits in IQ, particularly performance IQ.

In a subsequent review of 14 studies, Monarch and colleagues (36) described a trend in the research of using fewer neuropsychological tests (typically involving a single cognitive domain and frequently measuring executive function). The results of 10 of these studies showed impairments in one or more cognitive domains affecting motor skills, visuomotor speed, immediate and delayed verbal memory, visual memory, visuospatial organization, and executive function involving decision making, planning, and cognitive flexibility. A follow-up investigation found impairment in 7 of 9 cognitive domains with Digit Symbol scores (measuring visuomotor speed, attention, and intelligence) that were 3 to 5 standard deviations below historical controls. (36)

In our review of 29 neuropsychological studies (10) involving 680 patients with BPD, 530 healthy controls, and 195 psychiatric controls, findings from 83% (24/29) of the studies showed impairment in one or more cognitive domains. Samples were primarily women aged 18 to 50 years and included both inpatients and outpatients. Some studies used healthy and psychiatric controls that were frequently matched on age, education, sex, and less frequently on IQ. Where relevant, comorbid confounders were statistically analyzed.

Most frequently reported in 12 (86%) of 14 BPD studies were executive functions of decision making, response inhibition, speeded visuomotor processing, and cognitive flexibility. Affected non-executive functions were simple visual and verbal memory and attentional deficits (reported in 60% to 71% of studies reviewed). Least affected (reported in 50% to 57% of samples) were spatial working memory, planning, and IQ (Figure). Recent fMRI evidence has demonstrated functional anomalies that affect localized brain regions activated during the performance of these tests. Prefrontal regions that involve dorsolateral (executive/intentional/top down) and their deeper orbitofrontal functions (intentional and autonomic/ bottom up) and connections to the amygdalae appear to be affected in BPD.

Figure

Neuropsychofogicaf impairment
in borderline personality disorder

Most frequently affected (in 71 % to 86% of studies):

Decision making, response inhibition, rapid
visuomotor processing, nonverbal memory

Moderately affected (in 60% to 67% of studies):
Attention, verbal memory, visuospatial organization

Least affected (in 50% to 57% of studies):
Spatial working memory, IQ, planning

These impairments seem to exist beyond control of the effects attributed to comorbid depression, history of substance abuse, and current prescribed medications--all known to affect neuropsychological performance. What is less clear is the effect of known or unknown learning disabilities/ADHD and whether there has been a traumatic brain injury, because these have not been systematically controlled for in most studies to date.

Could lower IQ and smaller hippocampi compromise overall adaptation and coping and result in greater risk for the development of BPD, as has been suggested in individuals with PTSD? (37,38) Investigations of neuropsychological function continue to be challenged by small, underpowered samples, variable inclusion/exclusion criteria for Axis I and II disorders, and lack of systematic control for both known and unknown developmental or acquired CNS insults.

To compensate for these methodological limitations, Ruocco (39) undertook a meta-analysis of 10 neuropsychological studies involving 225 subjects with BPD and 263 normal controls and calculated mean weighted effect sizes for each of 6 cognitive domains. Using Cohen's guidelines, (40) all cognitive domains but one had moderate to high effect sizes with nonverbal memory having the largest effect size (1.59), followed by planning (1.43), and rapid processing (0.68). Ruocco concluded that there is a wide range of global deficits across domains in BPD, which supports theories of disrupted connections between the prefrontal cortex and other brain regions subserving higher cognitive functions. The nonverbal memory impairment is further suggestive of a more localized type of impairment. Ruocco argues that these findings were significant across studies and suggests that BPD constitutes a neurobehavioral disorder. He argues that the previously inconsistently reported neuropsychological findings in BPD (9,41-43) were most likely the result of small samples insufficiently powered to control for type 2 error.

Neuropsychological tests do not necessarily confirm localized brain dysfunction; however, examining relationships among related tasks with sensitivity for particular brain regions provides evidence of probable involvement of those structures (44,45) Because the interrelated functions and multidimensional nature of executive function remain poorly understood, laboratory tests challenge the interpretations of these findings. (46) The neuropsychological results found in BPD samples consistently suggest that many patients with BPD have executive function impairment. According to Cummings, (47) this type of impairment is strongly localized to the frontal regions. Furthermore, this neuropsychological impairment appears to be common in BPD involving at least half of all the BPD samples reviewed. With as many as 86% of samples demonstrating a range of executive function impairment, more thorough cognitive assessments are needed when planning effective treatment approaches for those with BPD.

Neurocognitive impairment and attachment

Infant development is believed to occur primarily through attachment, a genetically based behavioral control system that maintains infant safety and support through parental protection and care. (48) Although 13 empirical studies have found an association between BPD and insecure, preoccupied, and disorganized attachment, it is not known whether these attachment difficulties are causal or are the result of dysregulated behaviors associated with the disorder. (49)

Judd (49) suggests that cognitive impairment not only affects the caregiver's ability to parent but also the child's ability to interpret and integrate communications from the parent, thereby increasing the risk of an insecure attachment developing. Higher cortical development involving emotional regulation is believed to occur during a period of reliable communication between infant and adult when functions are shared and when caregiver responses are predictable and sensitive to the needs of the child. (50)

Neurocognitive deficits in children may impact their behavior in subtle ways so that the parent has a greater challenge in understanding the needs of the child and responding appropriately. Poor affective fit and opposing communication styles between caregiver and child may further compromise the formation of a secure attachment. High heritability of executive dysfunction in BPD suggests that one or both parents may have similar difficulties, which may interfere with the parenting of a child who requires more effective parenting to compensate for greater heritability" Cognitive deficits in children and vulnerabilities in caregivers could further affect childhood resilience in the face of maltreatment.

Although reports of sexual, physical, or emotional abuse and neglect are reportedly high in individuals with BPD, Lieb and colleagues (55) suggest that sexual abuse is neither sufficient nor necessary to make a diagnosis of BPD. This is supported by the findings of a meta-analysis that showed a low effect size (0.28) between sexual abuse history and BPD diagnosis. Childhood

attachment influences information processing, attention, and memory (53); therefore, we support the view that cognitive impairment may well be a moderator of the relationship between caregiving and the quality of the attachment. (49)

SUMMARY

BPD and acquired and developmental disorders of the brain appear to be associated, although the association is not necessarily specific because brain dysfunction also appears to be associated with other personality disorders. The lack of specificity, however, does not rule out the possibility that brain disorders may contribute to BPD. It is also possible that BPD causes an increase in the risk for brain insult (eg, because of the high prevalence of substance abuse comorbidity and frequent impulsivity that increase the risk of traumatic brain injury).

Longitudinal research is needed to address the temporal sequence criterion for causation. It is also evident that BPD does not develop in all individuals with a brain insult or disorder and not all those with BPD have had an identifiable brain disorder (recognizing that we may not currently be able to detect all such disorders). Clearly, brain disorders are likely to interact with psychosocial factors that contribute to personality dysfunction, and more work is needed to help us understand the complex biopsychosocial interactions underlying BPD. However, there does appear to be consistent evidence of an association with dysfunction of the brain involving regions that affect executive function in BPD. There is also some evidence of a biological gradient. (3,5-7)

Other mechanisms by which brain dysfunction might contribute to BPD are noteworthy. The frequent finding of a family history of impulse control disorders suggests that some patients with BPD have a genetically mediated disturbance in the brain's impulse control system. (51,54-56) Furthermore, there is considerable support for the hypothesis that BPD is primarily a disorder of disinhibition. (10,57-62) Neurodevelopmentally compromised children may thus be at greater risk for BPD by directly receiving a genetically mediated disturbance of brain function as well as being influenced by the disinhibited behavior of their parents (eg, perhaps contributing to abuse).

It is clearly plausible that insults to the prefrontal regions of the brain involving dorsolateral prefrontal cortex and orbitofrontal regions may cause BPD or BPD-like behaviors. Cummings (47) contends that lesions in this region appear to divorce frontal monitoring systems from limbic input, which results in disinhibited behaviors in which impulses are acted on without consideration of future consequences; antisocial actions occur; and emotional lability is marked. The preliminary yet growing body of evidence suggests that clinicians should not readily dismiss patient misperceptions, distortions, forgetfulness, or failure to learn or change as being only psychodynamically grounded. Comprehensive and systematic assessments of the potential neurological underpinnings of these challenging behaviors must be considered when planning treatment. A trend toward more psychoeducational and neurobehavioral rehabilitative interventions may be warranted for a significant subset of patients with BPD.

EDUCATIONAL OBJECTIVES

CME LLC is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

After reading this article, you should be familiar with:

* Evidence that is suggestive of a causal relationship between brain injury and borderline personality disorder (BPD).

* Neurocognitive vulnerabilities and impairments associated with BPD that may influence outcomes.

* How to establish the correlation between neurological impairments and BPD in patients.

Who will benefit from reading this article?

Psychiatrists, primary care physicians, neurologists, nurse practitioners, and other health care professionals. Continuing medical education credit is available for most specialists. To determine whether this article meets the continuing education requirements of your specialty, please contact your state licensing board.

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by Jeannette LeGris, MHSc and Rob Van Reekum, MD

Dissertation

What causes Borderline Personality Disorder?

In this essay I am hoping to find out whether it is more nature or nurture factors which contribute to people getting Borderline Personality Disorder. I will start off firstly with a brief description of what a personality disorder is before moving into my chosen topic.

Personality disorders have a long history of being very controversial especially when it comes to how to diagnose them and for many years were thought of as being untreatable.

(http://www.sane.org.uk/AboutMentalIllness/PersonalityDisorders)

They are divided into 3 different clusters according to the DSM IV.

DSM IV

This is a manual published by the American Psychiatric Association and covers all mental health disorders which can be diagnosed in children and adults. (there are 200 specific diagnostic categories for mental disorders). It also includes lists all known causes of mental disorders and statistics in terms of gender, age at onset, and prognosis as well as some research concerning the optimal treatment approaches. The way in which it defines as mental disorder is as a clinically significant syndrome which is associated with distress, a loss of functioning, an increased risk of death / pain, or an important loss of freedom. The assessment of these disorders is usually based on five axes so as to provide a more complete picture of the individual. In terms of personality disorders they are usually diagnosed when core impairments or pathological personality traits are so severe or extreme that they stop the person living a normal life or if other criteria are met.

The way in which clinicians diagnose any personality disorder is through a series of Axis's which are set out by the DSM IV and are listed below…

1. AXIS I – clinical symptoms – this is what we typically think of as the diagnosis e.g. depression, schizophrenia or social phobia.

2. AXIS II – developmental disorders and personality disorders…

    - Personality disorders are clinical symptoms which have a more long lasting symptoms and encompass the individuals way of interacting with the world.

3. AXIS III – Physical conditions – which play a role in the developmental, continuance or exacerbation of Axis I and Axis II disorders.

    - Physical conditions such as brain injury or HIV/AIDS that can result in symptoms of mental illness are included here.

4. Axis IV - Severity of psychological stressors…

    - Events in a persons life such as death of a loved one, starting anew job, college, unemployment and even marriage can impact the disorders listed in Axis I and Axis II. These events are both listed and rated in this axis.

5. Axis V – Highest level of functioning…

    - On the final axis, the clinicians' rates the person's level of functioning both at the present time and the highest level within the previous year. This

helps the clinician understand how the above four axes are affecting the person and what type of changes can be expected.

http://allpsych.com/disorders/dsm.html

The way in which the DSM is different to the International Classification of diseases (ICD 10) is that, in the ICD even though it lists the same disorders as DSM IV some of them have different ways in which to diagnose them such as Bipolar 1, which in the DSM IV states that you need to have at least 1 episode of mania which lasts at least a week, whereas the ICD states that for the same disorder you need to have at least 2 episode of mania.. Also another difference between the two is how they classify Borderline Personality disorder as DSM IV has it classified as emotionally unstable personality disorder, whereas in the ICD 10 it is split into two categories which are impulsive type and borderline type.

(Oxford revision guides – Grahame Hill)

There are also other personality disorders which come under these but the ones above are the 10 most commonly seen personality disorders.

The way in which personality disorders are described in the DSM IV is through different categories depending on what traits are more dominant. There are three categories they are Cluster A - odd or eccentric thinking or behaviour...

- Paranoid PD – distrust and suspicion of others, believing that others are trying to hurt you, and emotional detachment,
- Schizoid PD – lack of interest in social relationships, limited range of emotional expression, and appearing dull or indifferent to others.
- Or Schizotypal PD – peculiar dress, thinking, beliefs or behaviour, discomfort in close relationships, and indifference to others.

Cluster B – dramatic, emotional or erratic disorders are....

- Borderline PD – impulsive and risky behaviour, unstable moods, and volatile relationships.
- Antisocial PD – disregard for others, persistent lying or stealing, and aggressive often violent behaviour.
- Histrionic PD – Constantly seeking attention, excessively emotional, and unstable mood.
- or Narcissistic PD – believing your better then other people, exaggerating your achievements or talents and failing to recognise other peoples emotions and feelings.

The last category which is Cluster C which are the anxious disorders or fearful thinking or behaviour such as....

- Avoidant PD – timidity, feeling inadequate, and social isolation,
- Dependant PD – excessive dependence on others, a desire to be taken care of, and tolerance of poor or abusive treatment.
- or OCD – extreme perfectionism, preoccupation with orderliness and rules and a desire to be in control of situations.

it is estimated that around 13 % of the general population suffer from a personality disorder, and it is more commonly seen in females then males. Also those who have been diagnosed are also most likely to be diagnosed with another sort of comorbidity such as depression, eating disorders or panic attacks.

Research has shown that some sufferers can improve with age such as those with antisocial behaviour PD. But not all sufferers are so lucky especially those with schizotypal PD as it tend to develop into full blown schizophrenia with age.

(http://www.rcpsych.ac.uk/mentalhealthinfoforall/problems/personalitydisorders/pd.aspx)

Borderline Personality Disorder

I choose to focus more on borderline personality disorder in this part of the essay as I found through doing research that I can find more things out about it which relate to my title than any of the other personality disorders.

Borderline Personality Disorder was first named by Adolph Stern (1930) and is a serious mental illness which tends to appear in patients during early adulthood. It is where the sufferers suffer on - going intense emotional pain and difficulties with managing their emotions in everyday life. But it isn't a 'pure' mental illness as it tends to appeared with things such as eating disorders, substance abuse, or depression. It is also referred to as an individuals need for close, secure relationships that they constantly sabotage. However the condition itself is very uncommon as only around 1% to 2% of the population in America suffer from it, yet it accounts for about 25% of all psychiatric admissions. It can also be very life threatening at times, as some sufferers try to commit suicide. It has been suggested that around 30% to 40% of suicides committed are by people who are suffering from Axis II disorders' including borderline personality disorder and anti social personality disorder. (Duberstein and Conwell 1997)

Also the suicide rate for those sufferers of BPD who have tried to commit suicide already or self harm is around 36% to 65% which shows that suicide is a big problem when it comes to treating Borderline personality disorder.

(*Dialectical Behavior Therapy (DBT) for Borderline Personality Disorder* by Marsha Linehan, Ph.D. ~ from The Journal, March 1, 1997, Vol. 8/Iss. 1.)

The three main symptoms of Borderline Personality disorder are instability of interpersonal relationships, distorted self image and frantic efforts to avoid real or imagined abandonment. These are the symptoms which distinguished it from bipolar disorder which has similar symptoms. All of the symptoms of both BPD and depressive episodes of bipolar are listed in the table below.

Borderline Personality disorder	Bipolar
Frantic attempts to avoid real or imagined abandonment	Fatigue or loss of energy
Unstable or intense interpersonal	Sleep problems

relationships	
Identity disturbance	Inability to experience pleasure
Recurrent suicide behaviour	Thoughts of death and suicide
Unstable mood swings	Irritability
Chronic feelings of emptiness	Feeling hopeless
Stress related paranoid ideation	Appetite or weight changes

(Differences between Borderline personality Disorder and Bipolar – table above)

These symptoms are likely to affect a sufferers whole life/ many aspects of their life. For example losing their jobs, being separated from their family as their family may not be able to cope, or more such as committing suicide, or suffering from an eating disorder.

Treatments

The way in which Borderline personality disorder is treated is based on which symptoms are most dominate in an individual. There are two types of therapies which is used to treat BPD, these are Dialectal Behaviour Therapy and transference focused psychotherapy.

DBT

One method is Dialectal behaviour therapy which uses Martha Linehan's (who is an important person in the change of attitudes towards BPD) dialectical behaviour therapy. This therapy has its roots in the approaches of cognitive and behavioural psychologists. This seeks to teach the patient how to learn to take better control of their lives, emotions and cognitive restructuring in a group setting. However it's isn't the best method of treatment for BPD sufferers who are unable to learn new concepts, as this method requires the person to learn new and complex skills, but it doesn't work for all sufferers.

However there is evidence which shows that in some cases it can be useful as a study done by Linehan et al. 1991, where she compared the effectiveness of DBT against treatment as usual found that those who got DBT were less likely to get engaged in parasucidal acts then those who just got the normal treatment. Also the medical risk of parasucidal acts were also higher in the normal treatment group then the DBT group.

(http://priory.com/dbt.htm)

Transference Focused Psychotherapy

The other form of therapy you could do is Transference Focused Psychotherapy, which comes from the psychology approach of Psychodynamics. This is where unconscious feelings are projected onto the therapist. These feelings provide a basis for identifying, accepting and discussing the therapists interpretation of the problem. It

is also believed that through transference, the therapist can see how the individual interacts with people, and so because of that the therapist can then work on building healthy relationships for that person. This therapy is important as Psychodynamics believe that the causes of the symptoms of BPD is linked to dysfunctional relationships in childhood that continue to impact adolescent and adult relationship functioning. It is also believed that through our interactions with our caregivers in early childhood, we develop a sense of self, as well as mental representations of others. So if something goes wrong in that development that we may end up with problems in later life of having difficulty forming solid sense of self or have problems in how we relate to other people.

Hospitalization

. This is used if there is a serious concern with the sufferer such as they are threatening to commit suicide, or are starving themselves. Most sufferers who are a serious concern are partially hospitalization or attend day treatment programs as this allows the individuals to gain support and structure from a safe environment. This is helpful if the sufferer is going through a stressful time as it means that they are able to get help quickly if they need to.

Medication

If none of these works then the patient will be put on medicines. These include antipsychotic drugs which are listed below….

- Haldol (Haloperidol)
- Zyprexa (olanzapine)
- Clozaril (clozapine)
- Seroquel (quetiapine)
- Risperdal (risperidone)

These are used to help paranoid thinking, reduce anxiety, and any anger / hostility. They work by blocking the serotonin or dopamine receptors in a sufferers brain. However as there are two types of Antipsychotic's – typical and atypical, you have to be careful which one you give to sufferers. As typical Antipsychotic's which are the older variety, tends to only be given for short term treatment. This is because if you use typical Antipsychotic's for longer period of time then it can result in some very serious side effects, so they not the first line of treatment for BPD symptoms. The other type Atypical however is the newer generation of Antipsychotic's and so can be used for longer as it tends to produce less of the movement related side effects such as akathesia and Tardive dyskinesia.

Also the types of Antipsychotic's which are used are for BPD are also commonly used for schizophrenia and bipolar.

Antidepressants such as….

- Nardil (phenelzine)
- Prozac (fluoxetine)

- Zoloft (sertraline)
- Effexor (venlafaxine)
- Wellbutrin (bupropion)

These are used for Bpd sufferers who suffer from low moods and depression like symptoms. Most Bpd's are on one type of these. They work by increasing the amount of serotonin available in the individual brain (SSRIs).

Anti anxiety drugs which are…

- Ativan (lorazepam)
- Klonopin (clonazepam)
- Xanax (alpazolm)
- Valium (diazepam)
- Buspar (buspirone)

Are used to reduce intense anxiety, which some sufferers of BPD may experience and works in a similar way in which anti depressants work.

And lastly anti seizure / mood stabilisers drugs….

- Lithobid (lithium carbonate)
- Depakote (valproate)
- Lamictal (lamoqtriqine)
- Tegretol or Carbatrol (carbamazepine)

These are used to treat impulsive behaviour and rapid changes in emotions that are associated with BPD, and work by stabilising certain neurotransmitters in the individual brains to help to control emotional temperament and behaviour of Borderline Personality Disorder sufferers.

However all these type of medication should not be used long term as sufferers may become addicted and some of the side effects of these tablets can increase over a long term period.

Prognosis

Borderline personality disorder sufferers can recover from the illness is possible as Links et al,. (1998) found that 53% of patients who were followed up for seven years no longer met the diagnostic criteria for BPD.

(http://apt.rcpsych.org/cgi/content/full/6/3/211)

Also a study done by Anthony Bateman 2008, who did a 8 year follow up on patients who were treated for Borderline Personality disorder through either mentalization based treatment or treatment as usual such as therapy etc… He found that five years

after being discharged from a mentalization based treatment, those who were partial hospitalised showed better result compared to those who received the normal treat on things such as suicide rates which was 23% to 74% of those who received normal treatment. Also those who were hospitalised also had better results on diagnostic status (13% vs. 87%) and on how long they had to have the treatment (2 years vs. 3.5 years of psychiatric outpatient treatment.

He also had another things which he matched them on including use of medicine, their global function above 60, and vocational status such as whether they were employed etc..

Overall this study show that patients who have 18 month of mentalization based treatment through the sue of partial hospitalisation plus 18 month of maintenance mentalizing group therapy remain better then those who receive treatment as normal, how it does show that the partial hospitalisation group's general social function remained impaired.

(http://ajp.psychiatryonline.org/cgi/content/abstract/165/5/631)

Causes

There have been a few studies done into the causes of Borderline Personality disorder. One of these studies were reported by in the journal of psychiatristy and neuroscience Sept 2009. This article suggested that the reason why people get borderline personality disorder could be down to the size of their amygdale and hippocampus in the brain.

In the study they used a sample which contained 24 young female inpatients who had been admitted into the Asklepios psychiatric hospital in Gottingen, Germany. All of the patients had BPD and had been exposed to severe childhood sexual and physical abuse. They then assessed the patients within 3 weeks after they had been admission to the hospital when they were in a clinically stable phrase. To find out if there was something wrong with their amygdale and hippocampus they used MRI scans and lab testing. They also made sure that they exclude any patients who had a history of neurologic disease, electroencephalographic abnormalities or pathological MRI signal. To test their findings out they also recruit a control group through an advertisement in a local newspaper, and then matched the controls with the patients on terms of their age, height and years in education. The control group would be later known as the healthy participants.

They found that all the patients met the criteria for BPD and that BPD sufferers were found to have an 11% reduction compared to those who had BPD and PTSD who had a 12% reduction. These findings matched those found in previous studies where there was a 10 – 20% hippocampus size reduction in patients with BPD compared with healthy controls. (Godehard Weniger, MD, Claudia Lange, MD, Ulrich Sachsse, MD, and Eva Irle, MD 2008).

(http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2732745/)

This idea that something is wrong with a BPD sufferers brain was shown by NIMH funded neuroscience research (2001) which has revealed that the reason why people act impulsivity, are instable in their moods Has something to do with the brains mechanisms, including how much serotonin, norepinephrine, and acetylcholine a person has in their brain. This is because studies have shown that people with BPD have a low amount of those 3 chemical messengers which may be why they have trouble controlling their emotions as those 3 are important in controlling and regulating our emotions such as sadness, irritability, and anger just to name a few. However drugs which help to improve moods such as antidepressants can help to relieve these mood changes. Siever, showed that genes related to serotonin and neuropeptides which may be altered in some personality disorder such as BPD. (Larry

Siever, MD, Professor of Psychiatry and Director of the Special Evaluation Program for Mood and Personality Disorders at Mount Sinai School of Medicine 2006)

A study done by Harold W. Koenigsberg (2009) used MRI scans to observe how the brains of BPD sufferers reacted to social and emotional stimuli. He found that when BPD's tried to control and reduce their reactions to the stimuli, their anterior cingulated cortex and the intraparetical sulci areas of their brains stayed inactive compared to those healthy participants who were put in the same conditions. This suggests that BPD's can't actually control their emotions at all which may be why they have such extreme emotions compared to a healthy person. (Harold W. Koenigsberg, MD, professor at Mount Sinai school of medicine, Journal of biological psychiatry 2009)

Genetics

Trull et al. (2007) conducted a family based linkage study using 711 twins with phenotype and genotype data and 561 parents who had genotype data who were all drawn from the community based Netherlands Twin Register. They also assessed whether they had BPD on a quantitative scale. (http://www.tweelingenregister.org/nederlands/verslaggeving/NTR-publicaties_2008/Distel_PG_2008.pdf) They found that there was evidence of linkage for BPD in chromosome 1, 4, 9 and 18. However the highest peak was found on chromosome 9. In a earlier study e he used 5,469 twins from Netherlands, Belgium and Australia, found that 42 percent of *"variation in BPD features were attributive to genetic influences and 58 percent was attributable to environmental influences, and this was consistent across three countries"* *(http://www.sciencedaily.com/releases/2008/12/081216114100.htm)* There was also no significant difference between how many women or men inherited it . This study provides very strong evidence that it BPD may be genetic however we don't know if both twins got the disorder and whether the diagnosis of BPD in them wasn't mistaken for bipolar which tends to show similar symptoms and is quite often mistaken for BPD.

Psychological explanations

Some studies which support the idea that people may develop BPD through their experiences or environmental issues was shown by Linehan who found that some individuals with the disorder had come from homes where the had been abused (mostly sexually) or from suffocating families where the child used to be sent to their rooms if they needed to cry as they weren't able to show any emotion or from normal families who just couldn't cope with stress and so failed to provide the child adequate skills to be able to cope and the skills to be the able to control their emotions properly.

This idea is support by Miller 94 in the journal of Mental Health Counselling, that BPD is in fact misdiagnosed in some cases of sexually abuse sufferers But Freud (1920) said that children who had been abused tend to develop traumatic neurosis, which is where they re-enact those events which they went through, no matter how long ago it happened. This idea could explain why child sex abuse sufferers of BPD engage in dangerous behaviours such as promiscuity, difficultly in interpersonal relationships and substance abuse. Several theories has been put forward to explain why sufferers may want to repeat the experiences which they had to go through, one of those being by Van der Kolk 1989 who suggested that individuals get addicted to the trauma and therefore may want to recreate it such as a childhood victim becoming a prostitute. This idea of them becoming addicted to the trauma could also explain why BPD sufferers self harm as this could relate to their need to re create those feelings that they had during the trauma such as fear, pain, or shame or it could be that they have a perceived view that they need to keep people away and so self harm to make sure that people will stay away. (Van der Kolk 1989)

Another way in which this could relate to BPD is that the ratio of women to men child abused is 10:1 whereas the amount of women who is diagnosed as BPD is 75% of women compared to 25% of men. These ratios are similar for both categories and so could show that there is actually a link between BPD sufferers and those who had been sexually abused. If this is true then maybe experience are a bigger factor of developing BPD then problems with your brain.

Another idea would be that it could be down to whether the sufferer ever had an attachment to one of their parents, and if so then what type of attachment did they had as you are more likely to sufferer from something like BPD if you had an insecure attachment or no attachment at all. Attachment theory is the emotional bond which a child has with their parents. However if this bond is broken like what is suggested above then this could have disastrous consequences on not only the child's development but also through the way in which it behaves towards other people of their own age. There are 3 different types of attachments secure, insecure avoidant and insecure resistant. All 3 of these types have different behaviours to them but only two insecure avoidant and insecure resistant are the ones to worry about as they both demonstrate abnormal behaviour towards their mother and the ability to explore. This could result later on in life to having difficult forming other attachments with other people such as romantic partners. This idea is supported by the journal of counselling and development which says that personality disorders can be viewed "*as the outcome of insecure working models that have become self confirmatory and dominated by feed forward processes.*" C:\Documents and Settings\2701373\Local Settings\Temporary Internet Files\OLK477\Download_Document chosen from search.html.

The internal working model is how we view ourselves, others and the world. It can also influence what we expect of ourselves, others and the world in general, and so because of that could effect how we respond to different situations. So therefore what this quote above is saying is that BPD sufferers working models have become inflexible and as a result closed to new information and so because of this it means that the sufferer *"experiences significant distress in social, occupational, and relational functioning."* C:\Documents and Settings\2701373\Local Settings\Temporary Internet Files\OLK477\Download_Document. This relates to BPD or any other personality disorder as the feelings which sufferers feel when their working model doesn't work is exactly the same as those that have a personality disorder. Also you can diagnose PD basically by using Bartholomew (1990) four dimensional models of self and others. This is a big step to link BPD with attachment, even though it should have been picked up long ago as if you look at the insecure attachment, the feelings and behaviour they display is almost exactly similar to those that have BPD.

Even though this could be a very simple explanation for BPD developing many people only think of childhood abuse. What about bullying as a whole or living in a 'toxic' environment? Its true, researchers have found that some sufferers have actually had experiences or came from a environment like that. This can affect them as it means that the child grows up feeling *"that his emotional responses are not correct or considered in the regular course of things. Over time, this can result in confusion and a general distrust of a person's own emotions."*
http://bpd.about.com/od/environmentalcausesorbpd/a/Invalidate.htm

Other environmental factors such as divorce, neglect, substance abuse, or death which accorded during a sufferers life are also more likely to get it as well as those children who have a learning difficulty or those who have certain temperaments such as being sensitive already etc……

As you can see from this essay BPD is a very complex and distressing disorder to have to cope with, and that there is still not enough evidence to work out what actually causes it to develop, especially as sufferers don't start to show the symptoms of it until they are in late teens. However what researchers have found is that it tends to be a mixture of genetics, individuals way of thinking, and environmental factors (such as

social stressors) which triggers the disorder. But of course with any mental illness there will always be different things which cause it for each individual, as not everyone *is the same, just as not everyone will* BPD will have the same symptoms. So unless you get all the BPD's from all around the world (which will be hard as there is probably a lot more people out there who haven't been diagnosed then who is) in one room and test to see exactly what causes it you will never know the real answer, and even then you won't get a precise reason.

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Presentation

What causes Borderline Personality Disorder.

Extended Project

How I chose my Title

- The way in which I choose What causes Borderline personality Disorder, Is that I wanted quite a broad title so that it would be easier to write about.
- Also as it's a mental illness it makes sense to do something about what causes it, as there will always be evidence out to point towards one side of the argument or the another.

What I had to do.

- To start the project off I did a mind map of all the ideas I could do, and then once I did that, I then narrowed it down to 2 ideas which I would like to do and then did another mind maps for them.
- I also had to draw out timelines and keep a record of everything which I have done throughout the project.

- Once I had decided on my title I then had to go and find as much information as I could so that when it came to writing the actually piece I wouldn't have to go hunting for any research which I have missed out.
- Once all that had been done then I could start writing my dissertation.

The good bits about this

- One of the major good things which I pick up from doing this is certain skills which I will need at university such as time management, working by myself, and good presentation skills.
- Also it give more of an insight into clinical psychologist and how difficult it is to treat certain mental illnesses. As I found out when trying to find out prognosis details about Borderline Personality disorder.
- Also by doing a dissertation it meant that I don't have to collect any primary data, which means that therefore I can concentrate just on the dissertation itself.

The bad points of doing this project

• The first bad thing about doing this project, was that I didn't realise until I started writing how long this dissertation actually had to be. However as it was a topic which I enjoyed it meant that it wasn't that hard to write the amount that I needed.

•Also I didn't realise how difficult getting the sort of articles I would need was. Especially as on Athens most of the articles I could get were abstracts or were something which didn't relate at all to what I was meant to be looking for.

•Also the information that I did get, I then had to decide what I actually wanted to use, which was very time demanding as it meant reading through all the information and highlighting the bits I wanted.

Evaluation

- Overall I think this project went quite well, however I did have a few problems along the way such as exams, and having to completely change my project.
- It has also taught me a lot of new skills which I didn't have before.
- If I could do this again I think I would get my research more organised, and use more peer reviewed articles.

Questions I was asked - Does it affect one group of people more than others.

2. Tell us a bit about borderline personality disorder.

3. Is this something you [illegible] at university?

Evaluation

AO4

Evaluation

- When I was doing my media question about online relationships I learnt about how to start to write up a research project. However because I was inexperience at designing questionnaires it meant that the questionnaire ended up being too unethical to even run.

- Another problem with my first idea was that as i was working alone I only had my ideas to rely on. So if I was to do this again I would probably ask people for help so that I don't fall into the same problems as I did this time around. This way I could make sure that my questionnaire is ethically right and so would be able to carry out the whole study.

- Also with this idea I jumped in too quickly, as I hadn't work out how easy it was to get information about online relationships for the introduction of the report. Also this meant that I didn't sit back and thinking about my questions, as I think I wanted to get my questions done as quickly as I could, as I had a fair idea that the gathering and sorting out of my data would take the longest and so I didn't want to run out of time.

- I way in which I made that my second and final idea wouldn't turn into such a mess as the one before was that identified the problems I made the first time around and made sure that this didn't happen again. I did this by making sure I spent more time thinking about what needed to be put in and what information I would need.

- By doing this it meant that when it came to writing up the dissertation, I had lots of information which I could use, which meant that I didn't have to stop my project halfway through just to find some information which I need.

- Also this time around my supervisor also prompted me to dig a lot deeper then I already had and pointing me in the right direction towards what kind of articles I could used use such as peer reviewed and where I could look for it, as this is the first time that I have had to look for articles.

- I way I which I managed to keep myself motivated through out this project is the thought that in the end not only will I have learnt key skills but also it will get me ready for what university will be like. It also help that the topic I was doing was something I enjoyed as otherwise I don't think I would have carried on with it as long as I did.

- I am very happy with what I have done as I don't think there would be much I would change other then organise my time more, and use more peer reviewed articles.

- one of the really big things I'm learnt through this is how important time management and organise is. Even though i got it in on time, i got quite stressed out, and i think i could have been more organised in saving things, as i had lost some of it, and had to do it again.

AO4

– good honest evaluation here

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