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2007-09-14: Children and false memories

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Today's topic is children and false memories. There is some overlap with the last lecture (Tim's) but this one is focusing on children

Is it is possible that this child is claiming to have experienced an event that did not happen? Today I'll show you that this can happen.

McMartin preschool chase: well known in the USA. In that case 7 teachers were accused by hundreds of children for sexual abuse. These researchers, McGoven and colleges analyzed the investigative interviews, and it appeared that suggestive techniques were used which have might led to false memories. This has stimulated the study of false memories in children.

Bidrose and Goodman study (2000)

In studies on real victims it is hard to know what happened to them, and if we want to study if memory is false or not we have to be sure what happened. In the Bidrose and Goodman study they knew what happened. They did a case study on 4 girls, where there was evidence of the abuse (photographs and audio recordings), so they could compare the facts with the testimonies. They found that for almost 80% of the allegations there were some evidence in pictures or audiotape. For about 40% of the acts they didn't give testimony about them. There was no evidence for about 20% of the allegations. One could argue that the testimonies about these acts might be false memories. Studies like this one are very rare, since we rarely know what happened.

So, we have to find another way, using lab studies:

False memories for details and false memories for whole events should be kept apart. The papers in the classfronter (Kimberly &..) are about this topic.

You can imagine that you add details to an event, is it a false memory?
You can also study false memories for entire events.

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The paradigms for studying this are different

False memories for events

Paradigms:
The DRM (Deese-Roediger-McDermott) paradigm, uses the critical lure mechanism.
You study a list of words all related to a more central word which is omitted. E.g. sleep.
One might argue that this is a false memory for detail, not the entire list. Adults are likely
to falsely report remembering this word when asked if the word was in the list. What
about children? There is a difference. One of the first studies, Mark Haus' study in 1995:
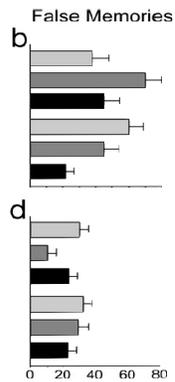
Compare the light blue bars from the graph. Adults (b) report more false memories than children(d), so they are more susceptible. A reason for this might be semantic networks. The DRM paradigm activates semantic memory, and we make source-monitoring errors. Adult semantic networks more extensive than children's semantic memories, so it is more likely that adults have more errors. Some researches claim that the DRM has low ecological validity, as it is not natural, and completely from false claims about sexual abuse. To solve this problem researches use emotionally negative lists instead of neutral ones. What happens if they study negative word lists? Do they report the same number of errors?

Howe (2007) studies this with children:
- 3 neutral DRM-lists: chair, fruit, sweet
- 3 negative-emotional DRM-lists: anger, cry, lie

Children were more likely to develop a false memory for neutral words as compared to
emotional ones. He also found an effect of age: 12 year olds are more likely to develop
false memories as compared to younger children. The finding that neutral word lists elicit
more errors than emotional studies is quite robust, and have been replicated in
Maastricht. In this study they used 5 neutral and 5 emotional lists:

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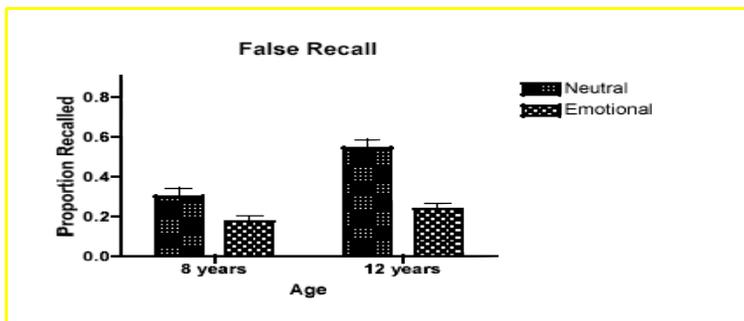
Still, one could argue that this paradigm is not that ecologically valid, it is might be more valid to look at the performance of PTSD patients. How do these people, who have experienced a traumatic event, perform on a DRM task? E.g. Tim's study on Bosnian PTSD patients. They recall more critical lures than control patients, so they're more likely to develop false memories than non-PTSD patients, and they've got problems distinguishing between internally activated and externally activated memories.

Tim's study:
- PTSD – posttraumatic stress disorder
- After traumatic experience
- Reexperiencing the trauma: flashback and nightmares
- Avoidance behaviours
- Increased physiological arousal
- Traumareleated false memories (Brennen, Dybdahl, & Kapidžić, 2006)

Trauma (= war in Bosnia) exposed participants with (n = 50) and without (n = 50) PTSD
Wordlists:
- 10 non-trauma: wedding, school, flowers, sea, love, sleep, match, child, music, letter
- 10 trauma: blood, concentration camp, war, shell, tears, funeral, wounded, Sarajevo, rape, refugees

Results:
Significant Group x List interaction, $F(1,98) = 7.34$, $p < .01$; PTSD-patients falsely recalled more war-related critical lures than did control participants. might be beacause of source monitoring errors.

So far: Children are less likely to recall non-presented words. Here we see a developmental trend. Children falsely recall fewer emotional negative words than neutral words. PTDS increases the recall of the trauma related non-presented words (in adults).

Comments: It could be because of the stronger relations between the nodes might activated faster, the critical word must be activated, then you make an error, and in PTSD patients it might be faster.

The Misinformation Paradigm
The idea is that a lot of things happen in between the experience of an event and the moment you have to recall that event. The event and the recall of that event don't have to happen on the same day. You can read about the event in the media, you might have talked with other victims or friends and family about the event, and as a result you might encounter misinformation. What is the effect of this information on your later recall? It might be that children in particular develop false memories as a result of the misinformation.

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Studies started with Loftus and Palmer in 1974: They wanted to know what the effect of misinformation was on adult's memories. They showed participants with a video of a car crash. Then they asked how fast the car was going when they hit each other or ".. smashed into each other". The last question suggests that they were going much faster. The participants where then asked to give an estimation about how fast they thought the car was going. If prompted with the "smashed variant" it elicited a much higher answer. Then, they had to answer "did you see any broken glass". The word smash led to much higher degree of false broken glass memories.

Verb	Mean speed estimated
hit	34.0
smashed	40.5

	Verb condition		
Response	smashed	hit	control
yes	16	7	6
no	34	43	44

So, a suggestion: Misinformation clearly has an effect on the development of false memories. What is the effect of misinformation on children? Sutherland & Hayne 2001:

24 children, M = 11.59 years
24 adults, M = 20.21 years

Procedure
- Video about child who becomes separated from caregiver during shopping trip
- Interview:
  - Neutral: "In the video Mary was given a bear. Who gave her the bear?"
  - Leading (consistent with content): "In the video, Mary was given a white bear. Who gave her the bear?"
  - Misleading (inconsistent with content): "In the video, Mary was given a green bear. Who gave her the bear?"
- Memory test: "What color was the bear?"
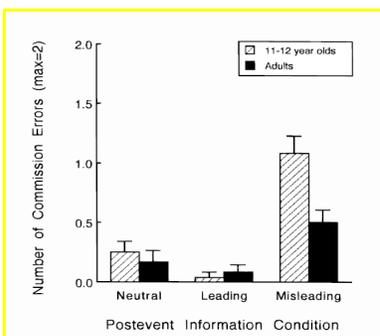
and adults are more likely to report a false memory in the
 compared to the neutral and leading questions. *Important:*
likely to develop a false memory than adults. In the DRM
!). In summary: Using a DRM paradigm the general
develop less false memories than older children, in the
reverse is true. This can be explained by *semantic networks*
hildren have less extensive networks compared to adults,

and are therefore less likely to develop false memories as compared to adults. In the misinformation paradigm you test your level of suggestibility, *children are more likely to accept misinformation* compared to adults. Children are more likely to accept what adults suggest, on the other hand children's memory is poorer when compared to adult memory, there are holes in their memory, and suggestions fill in holes. *The misinformation and the DRM paradigm tests different mechanisms (semantic network vs memory)*

It is not that easy to use lab results in a court, you can not say that children develop fewer false memories than adults, so for that reason the children in the McPearson case might all have been right, it is much more complicated.

Summary: Until now, many studies have shown that children easier develop false memories, and they change memories. Only a handful of studies have focused on *omission* errors, are children likely to omit information based on a suggestion?

This is an important question, because clinical and forensic interviews ask children questions about things they know little about, this makes it possible that the questions suggest that things might not have happened actually happened and vice versa. There are 3 types of suggestions:

- False memories for details (commission errors)
- change errors
- omission errors

The design is a mixed design (M study, 38 7-year-olds and 47 11-year-olds): All children take part in a target event, a presentation about China. The presenter tells the children, showed pictures and so on. After three days the children were interviewed separately. During the questions different types of questions were asked:
- Neutral
- Suggestive
- Commissive
- Changes
- Omissions

After this they were involved in a free recall task. The presenter was not wearing glasses.

Commision question: "The presenter was wearing glasses, wasn't she?"
The recognition question: "The presenter was wearing glasses". First of all, we scored the children's correct recall. Older children had a better memory than younger children. Children were more likely to accept information involving a change (red vs green) as compared to commission and omission. Younger children are more susceptible to all three than compared to older children.

     1 point for each correctly recalled detial (inter-rater-agreement (r) = .97)

$M_{\text{older children}} = 17.09, SD = 4.57$
$M_{\text{younger children}} = 11.26, SD = 3.74$

$t(82) = -6.30, p < .01$
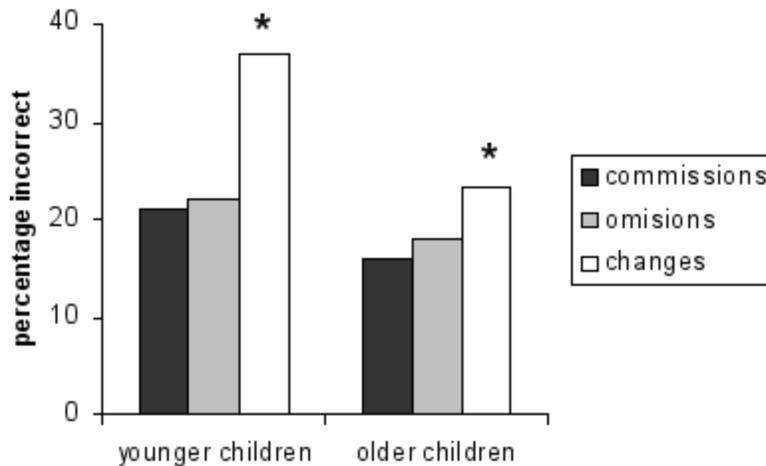
In conclusion: Younger children are more suggestive than older children. This whole finding is consistent with the discrepancy detection principle. "When I see nothing, and you suggest that you see a red car", it is more likely to distrust the suggest, but when you see a car there is at least some overlap, and you are more likely to accept the suggestion.

Back to the McMartin pre-school case

Children are likely to report false details about or to change the details of experienced event.
But are they also likely to report entire false events?

Implantation method
Children are more likely to report false details, but are they more likely to report false information about an event they have not experienced? There is only one valid paradigm for addressing this issue, the implantation method, using suggestion:

- You can present them with suggestive or false narratives
- You can present them with suggestive or false photographs

You try to implant memories for not-experienced events. the first to use this paradigm were Loftus & Pickrell (1995).

Loftus & Pickrell (1995)

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24 adult participants
3 true narratives, 1 false narrative (lost in a shopping mall)
3 test occasions

False narrative:
"You, your mom, Tien, and Tuan all went to the Bremerton K-Mart. You must have been 5 years old at the time. Your mom gave each of you some money to get a blueberry Icee. You ran ahead to get into the line first, and somehow lost your way in the store. Tien found you crying to an elderly Chinese woman. You three then went together to get an Ice cream"

T1: 7 (29%)
T2: 6 (25%)
T3: 6 (25%)

The participants listened to 3 true narratives and 1 false narrative (lost in a shopping mall). The parents of the participants helped in the experiment. They interviewed the participants on three test locations, "tell me as much as possible about these events". Are they going to give information about being lost in a shopping mall, something which did not happen? The experimenter included some personal information to make it more likely. The instruction was to "tell me more, give me as much information.

This lead the researchers to believe that people can be led to believe entire events that did not happen. Both adults and children are likely to develop false memories about such events.

False photographs

Quick repetition: The false photographs: 20 participants where tested, three true photographs and one false one. The participants were instructed to give as much information about the photographs as possible. After viewing him or herself in the hot air balloon this was the report:

"…Um basically for $10 or something you could go up in a hot air balloon and go up about 20 odd meter... it would have been on a Saturday and I think we went with, yeah, parents and, no it wasn't, not my grandmother…not certain who any of the other people are. Um, and I'm pretty certain that mum is down on the ground taking a photo".

People reported quite detailed false memories, such as who took the photograph. On the second interview after 1 week 60% of the participants had some kind of false memory. This is a quite dangerous that it is so easy to implant a false memory in participants. After this study using the doctored photograph paradigm, other researchers have used this paradigm, and both adults and children are susceptible:

- Surviving an animal attack (Porter, Yuille, & Lehman, 1999)
- Winning a contest (Ost, Foster, Costall, & Bull, 2005)
- Having an eventful birthday (Hyman, Husband, & Billings, 1995)
- Receiving a rectal enema (Pezdek & Hodge,1999)

Lindsay, Hagen, Read, Wade, & Garry, 2004

Both adults and children are likely to develop false memories as a result of the presentation of false photographs, for a variety of events. An argument is that people are unlikely to meet these kinds of events. Lindsay et al wanted to check if true photographs elicit false memories, when they listen to a false narrative.

Adult participants listen to a false narrative with and without a true photograph (of their class). The situation they were asked about was putting slime in a teacher's desk. Participants were interviewed twice about this false event. Participants in the photograph condition were more likely to develop false memories.
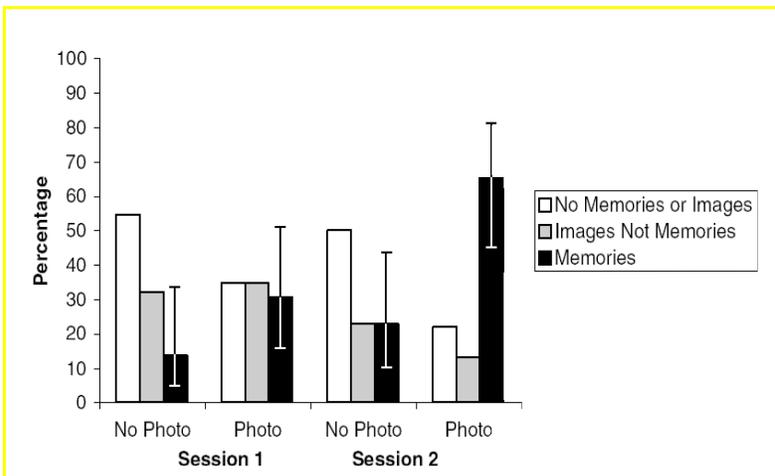
In summary: Adults and children can develop memories for events that did not happen, but at least one can argue that "lost in a shopping mall" is something completely different than being abused. It is a completely different type of event, being lost in a shopping mall is much more plausible for a child to happen than being sexually abused. This stimulated researches to study the factor of plausibility in false memories.

Plausibility in false memories

Pezdek & Hodge study from 1999: They created a plausible false event, the lost in a shopping event, and implausible: receiving a rectal enema.

Results (38 children):
- 54% no false memory
- 14 children "remembered" plausible but not implausible event
- 1 child "remembered" implausible but not plausible event
- 3 children "remembered" both false events

"It should be easier to plant false memories of childhood sexual abuse with children for whom childhood sexual contact with an adult is more plausible than with children for whom childhood sexual contact with an adult is less plausible."

Only one child remembered the implausible but not the plausible. Researches concluded that it is much easier to implant the memory of sexual abuse if it is plausible, if they've received physical abuse e.g.

In the Strange, Sutherland, & Garry (2006): Suggestive photographs study two scenarios were used:
- Plausible false event: hot air balloon ride

- Implausible false event: drinking a cup of tea with Prince Charles

They found that children were equally likely for both. Plausibility is not a factor.

Valence

However, nobody so far have studied the role of valence, and that might be one of the reasons for the different results in the two above. Misinformation, plausibility and valence are mixed together.

Study 1: False narratives

68 children, 8.65 years (SD = 0.67)

Procedure:
- 3 true narrative
- 1 false narrative:
    - ① Implausible/positive: "being the leading actor in a movie"
    - ① implausible/negative: "attacked by a monkey"
    - ① plausible/ positive: "being on the top of the Eiffel Tower"
    - ① plausible/negative: "almost choked on a candy"

The plausibility were deiced based on a pilot study, where kids rated the plausibility of 16 events.

Children were interviewed twice, with one week between each interview, about 3 true and one false narrative. Children were instructed to give as much information as possible about the events. The result: Valence didn't play a role for improbably events. They were more likely to have a false memory about "choking on candy" than "being on top of the Eifel tower. Although, they controlled for general plausibility one might argue that the two differ in personal plausibility and script knowledge. It might be that children are more likely to develop a false memory about choked on a candy, and they might have more script knowledge – they might not know about the Eifel tower, but have seen a friend choke on a candy, etc. The same applies to the rectal enema, it might be that children don't know about this situation, they don't know what it is and can't develop a false memory. For that reason there was a second study, with a false photo study, where all three possibilities were tested:

- General plausibility
- Personal plausibility
- Script knowledge
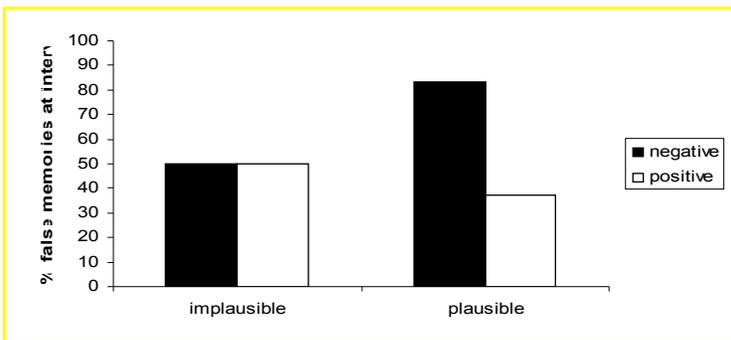
These events only differ when it comes to valence (tested with children).

This was the worst photograph we could show them, we could not show them photographs of the participants undergoing an operation or something like that.

Conclusion:
Valence plays a role in the development of children's false memories for plausible events.

But:
"almost choked" and "Eiffel tower" might differ in terms of personal plausibility and script knowledge

"General plausibility does not imply personal plausibility" (Scoboria, Mazzoni, Kirsch, & Relyea, 2005, pp. 793).
Prior knowledge affects the development of false memories (Pezdek, Finger, & Hodge, 1997; Pezdek & Hodge, 1999)

Example of false memory:

Child: This was when I was in the hospital in Hasselt. I was about 3 or 4 years old. And my hand was in plaster. And then a few people came to visit me and mum and dad were the whole day with me. Sometimes it was hard for me to sleep…um….I also got a present from mum and dad.
Interviewer: How did it happen?
Child: Because I dropped a glazed bottle and I wanted to pick up the pieces and then I cut myself badly. And then my hand was broken and I had to go to the hospital.

The story is quite detailed.

When one controls for general plausibility and script knowledge: These two are very important for the development of false memories, valence doesn't play any role when controlling for these two.

Results :
Number of children who developed a false memory for the hot air balloon ride (positive event) = number of children who developed a false memory for the admission into hospital (negative event)

Conclusion: When controlled for general and personal plausibility, and script knowledge, children are equally likely to develop false memories for positive and negative event.

How can you be sure that these children developed a false memory? Maybe they wanted to please you and came up with a story? On the end of the interview the kids were debriefed "I made it up, it never happened to you". The response of the children is that the children indeed developed a false memory, "I really remember it, I really think the photograph is real", it is not only compliance, it also has to do with memory.

True photograph method (Lindsay et al. 2004)

Comparing development of false memories for negative and positive events children are just as likely to develop false memories, so it could be that both tap the same mechanisms. What would happen if we compare false memories for a negative and a neutral event? This was tested by using the true photographs paradigm:

A sample of children rated about 20 events on a scale.

Child: I can remember I was doing math. I was sitting next to a boy or a girl, don't remember. Then I did something, and the boy said: "Why are you copying my work?" But I was only grabbing my pencil. Then he told the teacher and she said: "Why did you cheat?" But I really didn't.
Interviewer: What were you feeling?
Child: I was scared because I thought I would get punished.

Example of false memory report for copying off your neighbor.

It is quite detailed, the child reports details not in the false narrative, the child elaborates, indicates his or her emotional state as this happens. We only found a significant effect of valence, there were more false memories for the negative events as compared to the neutral one. The photograph had no importance. It could be that children are more acceptable, they don't need a photograph, just a narrative is enough. There might also be a kind of ceiling effect, there is not a lot of room for the photograph to elicit false memories.

	Interview 1		Interview 2	
	neutral	negative	neutral	negative
Photograph	10 (53)	14 (74)	12 (63)	17 (89)
No photograph	6 (32)	13 (68)	12 (63)	15 (79)

- Non-significant Valence X Photograph interaction
- Non-significant main effect of photograph
- Significant main effect of valence at both interviews; the negative event elicited more FM than the neutral event (ps < .05)

This is important because what we would like to do is to apply our lab findings to the real world. *Now we have more support for that children are more likely to develop a false memory for a negative event*. All the negative information is more integrated in our memory, as soon as an aspect, a detail of that information is cued, like with a photograph, that might result in the activation of other negative information. This activation might not apply to neutral information, which are not as integrated in memory.

Being abducted by a UFO

The false events I've talked about so far, copying off your neighbor, moving to another classroom, etc. there is a huge difference between these and sexual abuse. What about highly implausible events? Are children more likely to develop those? The rectal enema has no script knowledge, but how about being abducted by UFOs? According to Mazzoni et.al you have three factors which are needed:

Three-step model of false memory formation (Mazzoni, Loftus, & Kirsch, 2001):

1. Evaluate event as plausible
2. Belief that event did happen
3. Interpret images and thoughts as memory details

If you believe that the event happened to you might interpret the images and thoughts as memory, and if that happens you might start to develop a false memory. What we did in a study, we presented kids with prevalence information to make it more plausible that this happens (information about the frequency of the event falsely indicating that the event happens more often that what you think makes us more likely to believe that it has happened to you on a self-rating. After reading false prevalence information participants are more likely to believe that an event has happened to you). You might argue that beliefs and memories are different, but so far only beliefs have been studied. Previous studies: prevalence information increases the belief that a false event has happened (e.g., Hart & Schooler, 2006; Mazzoni, Loftus, & Kirsch, 2001)

Almost choked on a candy or abducted by UFOs.

The information was that when kids were 4 year old it happened very often that UFos were shown or "candies were taken out of the supermarket because they were dangerous".

- 50 8-year-olds, 50 11-year-olds
- True narrative: first day at school
- False narratives:
  - ① Almost choked on a candy: "your mother told me that you were at a birthday party when you were 4 years old. At this party you received a bag of candies. When you were at home again, you were allowed to have one cany. Your mother saw that you turned blue Then she hit you on the back and the candy came out"
  - ① Abducted by a UFO: "Your mother told me that when you were 4 years old, you were abducted by a UFO. This happened when you were alone outside. Your mother was inside the house. Then she suddenly saw through the window that a UFO took you"
- Prevalence information: false newspaper article

Children were assigned to one of the 4 categories. Design: 2 (age: younger children vs. older children) x 2 (false event: plausible vs. implausible) x 2 (prevalence information: yes vs. no)

They were instructed to give as much (false) information as possible about the event. There is a prevalence interaction, the prevalence information is something young children are much more susceptible to. Plausibility was not a factor. There was one factor so far

(earlier) about plausibility. So far, two studies show an effect, one study show no effect. What is interesting in this study is that almost a third of children have a false memory about a very obvious false memory. Again, the reports are quite detailed, "scary, emotionally negative", so if children are more likely to have false memories for such negative implausible events there might be a parallel with abuse memories.

Prevalence information might also be given to children in the form of testimony of other children, like if kids at school start to talk about sexual abuse, if one kid talks about sexual abuse a kid might get the idea that it is much more prevalent, this might also apply to the McMartin preschool case.

Example of false memory report UFO abduction:
Child: "I saw cameras and flashes and some persons in the UFO."
Interviewer: "How many persons did you see?"
Child: "approximately nine or ten."
Interviewer: "What kind of persons?"
Child: "Persons like me, children."
Interviewer: "What else did you see?"
Child: "I saw some persons and also some blue/green puppets were passing

Age x Prevalence interaction
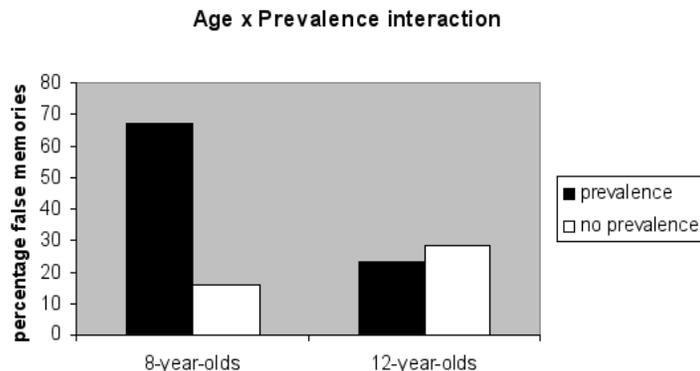
Summary: Bad news, children are likely to report false details and even false events, all kinds of events. The good news is that without exposure to suggestive information children are highly accurate. This comes from interviews with children of a very negative event that they had to experience, and they stay very accurate after a couple of year. The problem with children is that they are not very eager to talk about what happened to them, especially, in an investigative interview, they are often very quiet, the police has to get information, and might use suggestive questions, or imaginative techniques, information from other eyewitnesses and so in, this increases the chance of false memories.

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2007-09-17: The reliability of eyewitness testimonies and of confessions

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As you know evidence can come from different sources, such as witnesses, and suspects in form of confessions.

Today I'll talk about the reliably of eyewitness testimonies, the second part about confessions.

Part 1: Reliability of eyewitness testimonies

Why is this important? In some criminal cases, such as sexual abuse, it is not uncommon that judges have to rely on only one witness. Can they rely on these witnesses, trust them blindly? Is there one part of the testimony which can be relied on more? What factors increase and decrease this reliability?

First a small experiment. Video of a crime, just watch. (The Robbery). The message is clear: Eyewitnesses are very unreliable, others have concluded the same, e.g Wells 1998: Studied 40 cases in the USA where DNA was used to exonerate a previously convicted person. 36 (90%) involved mistaken eyewitness identifications.

When does it go wrong? The phases of information processing. First you have to *perceive*, then *encode*, then *store* and finaly *retrieve* to make a correct identification. In all the phases it can go wrong. Today I won't talk about perception, but encoding, storage and retrieval, which has to do with *memory*. An example of the effect on perception: If you're not able to perceive the crime shown correctly, of course it has an effect on the identification later on.

In case of eyewitness identification there are several factors which might have an effect on accuracy. Some are called estimator variables, some system variables.
* Estimator variables have an effect on *encoding and storage*
* System variables on *retrieval of material*

Estimator variables

Factors over which the criminal justice system has little control. This is something the police has to deal with, they can't control it. An example is stable witness characteristics, such as age. Children and the elderly have little control of this, they have to realize that these people are less accurate.

- *Malleable witness characteristics*, such as training in face recognition, which bank employees have been trained in. some times it increase the accuracy.
- Style of the presentation, how *confident* someone is, an eyewitness might say that he is 100% sure, but this confidence has no connection to accuracy, even if juries and judges pay a lot of attention to this.
- *Stable target characteristics*, such as facial distinctiveness. Suspects who are very attractive or unattractive are very easy to identify.
- *Malleable target characteristics*, such as disguise. A suspect who is wearing a hat at the time is harder to identify later. If they have changed their facial appearance as well
- *Environmental conditions*, when the perpetrator is in a group of many people he or she is less salient and less likely to be identified
- *The exposure duration*, it matters if you have watched the crime scene in 1 minute or half an hour.
- The *presence of a weapon* also seems to be important, more about this later.
- *Post event factors* are also important, by the passage of time we forget information, it matters if we do the eyewitness identification a day or 1 week after. If you read information about what has happened, e.g. in a newspaper or on TV it might have an effect on memory about what happened, and of course on our accuracy.

System variables

System variables are factors that are under the control of the criminal justice system, the police has an effect, and can control these variables, if they do this correctly they can increase the accuracy.

- *The lineup instruction bias*: The instructions are very important, the police should say that the real perpetrator might not be in the lineup. Eyewitnesses want to help the police, they don't want to say "I don't know", so if you don't give the proper instruction they might pick someone who is not guilty.
- *Foil bias* is also important: The suspect must not stand out, this seems obvious, but it has happened that a black suspect is in an all white lineup.
- *Clothing bias*: Are the lineup going to wear the different clothes. Research has shown that they should wear other clothes, because it gives the police the chance to make another lineup for clothes.
- *Presenting bias*: It is possible to display the lineup simultaneously or sequentially. The last option is the best one, since if you present all simultaneously eyewitnesses have a tendency to compare people with each other, and choose the one which looks the most like it. When done sequentially they don't know how many will be in the lineup and can't do this.
- *Investigator bias*: The person who gives instruction shouldn't know who is the possible perpetrator, as this might have a verbal or non-verbal effect

What about eyewitness testimonies?

It is common that eyewitnesses have to tell as complete as possible what they have witnessed. Is this reliable?

Like research on false memories we can discuss *field studies and lab studies*. What applies to studies of false memories also applies here. When we are conducting field studies we know for sure that the people have witnessed a traumatic event, but we don't know the truth, so we can't study the accuracy. This we can do in lab studies. In these we might study movies, words, the DRM paradigm, after that we study memory, recognition, etc. Based on this we can say something about reliability or in other words accuracy.

Eyewitnesses are incomplete
Example: Presented participants with a movie fragment, American history X. With a very negative scene. We ask the participants to recall the scene. We instructed them as "imagine you have to go to the police to give an account of what you have witnessed". All were scored on 31 details. 1 was didn't remember at all, 0 that they remember all the details. The results show that people only remember about 50% of the information that they have encoded, after 1 week it is even less than 50%.

Conclusion: Eyewitness accounts are incomplete, only about 50% is remembered. This doesn't say anything about accuracy.

From previous lecture, suggestions have an effect, you get commission errors, or information they did not see. Without suggestive techniques they account for only 10% of the complete memory output. They also come out at the end of an interview. When you put pressure on an eye-witness, "are you sure you don't know more about what happened", this increases the chance of commission errors.

What about accuracy?
- suggestion → false memories for details/events (lecture 1)
- Without suggestion: false memories for details (commission errors) < 10% (Dunning & Stern, 1992; Fisher & Cutler, 1995)
- Output order effect (Schwartz, Fisher, & Hebert, 1998)

Commission errors as a function of output order
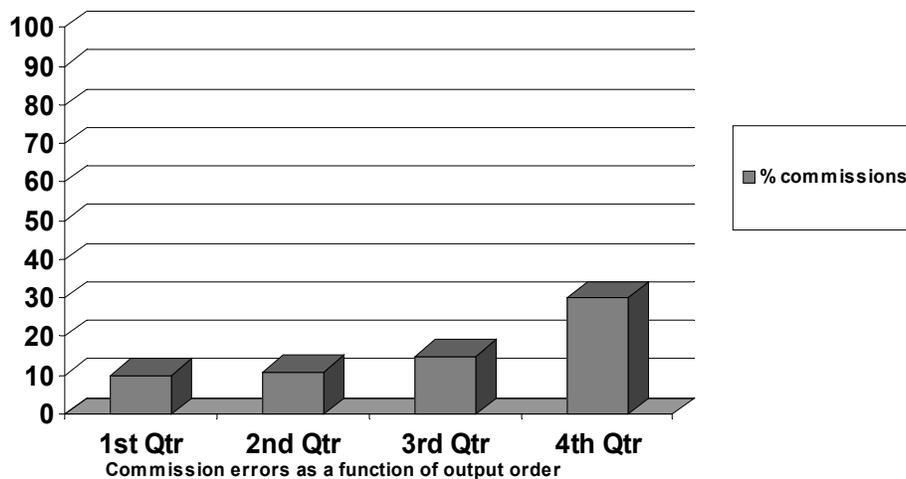
Do Eyewitnesses forget?
Incomplete, but somewhat accurate. Do we have an indication about what they do remember and don't remember? Studies on emotion has shown an effect. Most people know what they were doing on 9/11 when the planes crashed into the towers. Memories such as these are called flashbulb memories, memories for the circumstance, everybody seems to know what they were doing when they heard about the news, from who they received the news. According to the researchers this has to do with

- Emotional intensity
- Surprise
- Rehersal – it was that shocking, you rehearsed the information a lot
- Prior knowledge – there are studies of flashbulb memories on the death of princess Diana, those who know about a lot about the royal family have more accurate memories than they who do not.

Flashbulb memories (FBMs): memories for the circumstances surrounding the reception of news about a surprising or shocking event (Brown & Kulik, 1977).

Determinants of FBMs (Brown & Kulik, 1977; Conway et al., 1994)
- Surprise
- Rehearsal
- Emotional intensity
- Prior knowledge

Challenger explosion, death of Princess Diana, earthquake Turkey

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All these events have been used to study flash bulb memories (FBM). They've all indicated that the memories are quite consistent, with a year between the interviews people give quite consistent answers. This is a special quality of FBM.

Korsakoff patiens have amnesia, they're not able to retrieve memories from the past or store new information. In a study from a couple of years ago we wanted to check if these people do have memory from 9/11.

Korsakoff patients have FBMs (Candel, Jelicic, Merckelbach, & Wester, 2003):

T1: 15 Korsakoff patients and 15 controls
        Flashbulb Memory Questionnaire

T2: 8 Korsakoff patients and 13 controls
        Flashbulb Memory Questionnaire

Questionnaire twice, with 6 weeks between.

Section A: Event Recall
Do you know which disaster took place on the September 11, 2001?

Section B: Personal Memory (0-6)
Where were you when you heard the news?
What were you doing before you heard the news?
What did you do after you had heard the news?
Who were you with?
What time of the day did you hear the news?
How did you hear the news? From what source?

All the questions referred to the event

	Korsakoff	Controls
T1	10 (67%)	15 (100%)
T2	7 (88%)	13 (100%)

On the event recall test 10 of the 15 patients was able to give a reliable account of what happened on 9/11, so even when they had amnesia were able to recall this information. After 6 weeks they didn't know who the interviewer was, and she had to explain again, but the memories were slightly higher.

	Korsakoff	Controls
FBM score (0-6)	5.10 (SD=0.88)	6.0 (SD=0.00)
Consistency (0-1)	.28 (SD=.21)	.65 (SD=.18)

They do have FBM memories, to a slightly less degree than controls. But after 6 weeks they gave a completely different scenario, 0 is a completely different answer as compared to the controls. This indicates that they do have FBM but they are not accurate, they just come up with an answer.

What do eyewitnesses forget?

There is something special about memory and emotion.
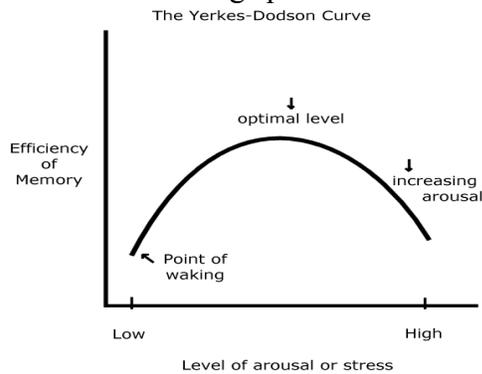
According to this curve there is a relationship between the factors and memory, specifically there is a limit on the effect on the effect on memory, when there is too much arousal and stress it has a negative impact on memory. A positive impact to a certain limit, then a negative impact.

Imagine that you are threatened by a man with a gun, how do you think that your memory for this event will be? The memory for the gun the central event will be good, but the peripheral details, such as the perpetrator will be poor. The attention is to the gun, what focuses the attention will be good. Emotion seems to have a specific effect on memory, good for central, not so good for peripheral.

- Peripheral versus central details
- Attentional narrowing hypothesis (Christianson, 1992)
- Weapon focus phenomenon (Steblay, 1992)

Summary
Eyewitnesses are incomplete, esp. with peripheral details, and they are accurate unless suggestion is involved.

Co-witness discussions

Unfortunately eyewitnesses don't live in isolation, that means that they're likely to talk to others about what happened to them, they're likely to discuss what happened to discuss with friends, family even other eyewitnesses. This happens between the witnessed event and interrogation. What is the impact of social influences on memory accuracy?

Case studies in the past have indicated that co-witness discussions have a negative effect on memory. E.g The Annna-Lindt murder in Sweden (Granhag, Ask & Rebelius, 2005), the Oklahoma bombing (Memon & Wright, 1999). In both cases eyewitnesses talked to each other -> Commission errors, and they misled the police. This meant it took a long while to get a clear impression of what happened. This has stimulated lab experiments of this phenomenon.

Social contagion of memory (Roediger, Meade, & Bergman, 2003)

The subjects viewed 6 scenes, for 15 or 60 sec, with a confederate (friend of the experimenter). In the second phase they had to recall all detail for each scene, together, they took turns in recalling details. The confederate recalled false details, some schema consistent, such as things you might expect in a kitchen, or schema in-consistent, things you would not expect.

In the third phase there was a individual recall test of as many items as possible. Are they going to incorporate false details? There was more intrusions with the false confederate, this was more pronounced in the 15 sec and schema consistent information.

Individual recall task

Results
More intrusions reported in exp. than control condition
Social contagion effect: 15 sec and schema-consistent

Memory conformity paradigm (Gabbert et al., 2003, 2007)

Some researches have said that this is not very ecologically valid, because it is not very usual that people take turn in discussing an event. For that reason Gabbert et al designed another paradigm: What they decided to do is to present participants with different videos, one person would see the perpetrator in a blue shirt, the other in a red t-shirt, while they didn't know that they were watching different videos. After the encoding phase the participants have to discuss the video together. They are given a couple of questions to guide the discussion. In the last phase they are instructed to participate in an individual recall task. Are people going to report details from the non-seen video? If that is the case they have incorporated the information given in the discussion with the co-witness.

In the first study with this paradigm they wanted to see what the effect of co-witnesses was, and if there was age differences in the effect. Two age groups were included, adults vs elderly.

Gabbert, Memon, & Wright, 2003

Method
- Participants of two age groups: 18-30-year-olds and 60-80-year-olds
- Video about criminal event
- ½ participants discussion
- Individual recall task

Results
- 71% of participants recalled item required during discussion
- No age differences

71% of the participants reported a detail that they did not see, something reported by the co-witness. There was no age difference. This is quite shocking, that by discussing an event with another person, you are likely to adjust to his or her memory.

Age differences in children (Candel, Memon, & Al-Harazi, in press)

In a recent study of the memory conformity effect we tested if children were likely to exhibit this. What we expected that the effect would be more pronounced in the younger group than the older group. The paradigm was exactly the same as above.

Videos – did she wear a cap? Result: Children are more likely to come up with unseen details from the other video than children who had not watched the video. The memory conformity effect is stronger than for the younger children. Our explanation so far for this effect is that older children might have encountered more misinformation than for the younger children, who don't talk as much. In the older age group they had more extensive discussions. (comment – social conformity)
There also was a second experiment, where the experimenters controlled the discussion, so that the discussions were equal in length and content, so they had to discuss the exactly the same questions. Then the misinformation effect was the same in both age groups. (not on foils)

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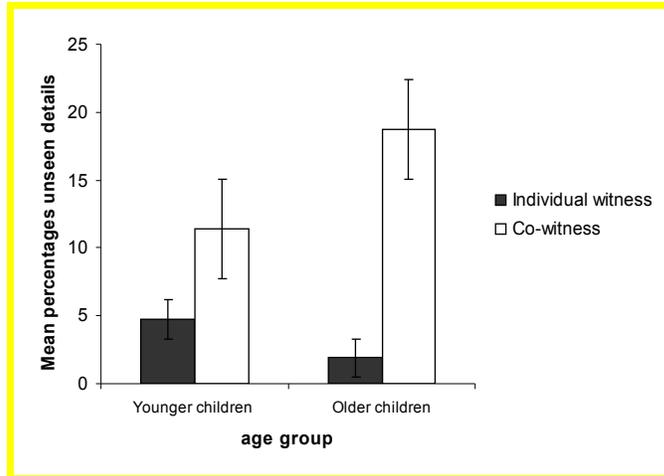
The reliability of confessions

This is another source of evidence. The Gilford Four and the Birmingham Six. They were charged with murder because of the confessions they made. In the case of the Birmingham 6 two did not confess that they did the bombings. They were released from prison as it appeared that they were all not guilty. The 10 (at least 8) made false confessions. Why do people do this?

- *Voluntary false confession*, there is no pressure from the police. People go to the police station and confess. Why? "desire for notoriety", Henry Lee Lucas, who confessed about 3000 murders. A reason for that might be that it made him special.
- Attempt to relieve guilt
- Facts from fantasy eg schizophrenic
- Protection of real criminal.
- Hiding other facts, e.g. people involved in a sexual relationship

There are many reasons why people might confess without the involvement of the police.

On the other hand:
- Coerced-compliant false confession: People commit that they did the crime, but they don't believe it, they just say yes to stop the interrogation, or they want food sleep etc
- Coerced-internalized false confession – people start to believe that they did the crime.

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False confessions in the lab

It might appear to be really stupid to confess a crime. Lab studies show that this is not so stupid.

Kassin & Kiechel (1996): The computer crash paradigm

They invited participants into the lab, on a reaction speed test. They had to type as fast as possible certain letters on the computer. They were also instructed not to hit the L key, as that would result in computer crash, which would cause a real problem for the experimenter. It was a 2 by 2 design, some participants were assigned to the high vulnerability condition where the speed was very high, half the presence of a false incriminating witness.

- Compliance
- Internationalization
- Confabulation

After a minute the computer crashed. Then they were asked to sign a confession. They also wanted to know if they internalized the confession. Afterwards they were free to go, and they met a confederate in the hall, what were they going to say? "I hit the L key", or the "they said I hit the L but I didn't do it!" afterwards they were asked to enter the lab again, and they were asked to explain what happened (confabulation) – do they come up with details that did not happen?

Form of influence	No witness		Witness	
	Slow pace	Fast pace	Slow pace	Fast pace
compliance	35	65	89	100
internalization	0	12	44	65
confabulation	0	0	6	35

In the confederate – fast pace condition 100% of the participants signed the confession. These results indicate that even normal students are likely to confess a non-committed act. But is this nothing compared to confessing to committing a crime? E.g. ecological validity. It is hard to increase this because of ethical issues. Do plausibility and consequences matter? Hitting the L is very plausible, murder is not, confessing to hit the L has no consequences, going to prison is a big consequence.

Plausible: Windows key
Implausible: F12 key
Results
Confessions: 77% plausible condition vs 58% implausible condition ($p = .16$)
Internalization: 26% plausible condition vs 0% implausible condition ($p = .01$)

The results of this study showed that in terms of compliance there was no difference, but in the case of internalization there was. In the plausible condition more people internalized that they had hit the "forbidden key", so plausibility matters.

Does consequence matter? In this experiment participants had to pay for the computer crash, for the damage they caused 250 euro. One participant signed that confession. Although it was approved by the ethical committee people started to cry and such.. On the next experiment they wanted to increase the impact of the confession.

New method: false video evidence (Nash & Wade, under review)

30 students
Session 1: computerized gambling task
- general knowledge 4-afc-task
- Feedback

What they did was to invite students into the lab, the experimenter also left some papers on the top of the pile there was a 3rd year exam, all the participants were in the 3rd year. And saw that here was a corner of the exam creased, and said "oh, you took a look, and I have to go to the exam committee and talk. Then he came back, and you have to sign a confession that you did it, then we'll discuss if you're allowed to do it or not". One person signed that confession.

Problem: The sample size was low, and the problems this caused for the participants got upset which led to the experiment being stopped. *Even with the plausibility is low and the consequence is high people are likely to confess a non-committed act*.

New method: False video evidence

Video editing: replaced green tick with red cross
Session 2:
- half of the subjects saw false video evidence (see-video)
  - ① half of the subjects were told that the video showed them taking the money (told-video)
  - ① Sign a confession (compliance)
- Conversation with confederate (internalization and confabulation)

The same researches who did the doctored photographs. ("doctoring stimulus material") Today lots of things are video-taped. What would the effect of this video evidence be?

They had to answer 4 alternative questions on the computer, for general knowledge, after each answer they got some feedback, when they answered a question correctly they were allowed to take some money, when they answered incorrect they had to give some money

to the bank. Video was taken, participants left the lab, the video was edited (green tick with red cross), indicating that people took money from the bank when the answer was incorrect. Half saw the video, half were told. Then they were asked to sign the confession (compliance)

Conversation with confederate (internalization and confabulation)
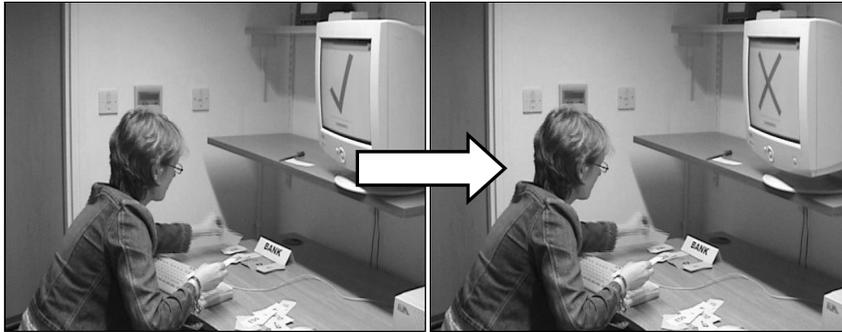
	Condition	
Confession Type	Told-Video	See-Video
Complied	100%	100%
Complied + Partial	67.7%	100% *
Complied + Full	60.0%	80.0%
Complied, Full internalization +	6.7%	20.0%
Complied, Full internalization +	0%	6.7%

It is interesting to see that in both conditions all participants signed the confession. False video evidence is quite strong. These results are quite dangerous.

An interesting question is: Is everybody likely to confess?

Research has shown that some people are more likely to confess. This is related to level of suggestibility, the Gudjonsson suggestibility scale (GSS), a score on this scale seems to be related to coming up with a false confession.

Gudjonsson Suggestibility Scale (GSS)
- Story
- Questions 1: memory (memory scale), suggestive questions (yield scale)
- Questions 2: memory (memory scale), suggestive questions (shift scale)
- Total suggestibility score = yield scale + shift scale

Some of the questions are memory questions, some are suggestions (including details not in the story). After the questions participants receive negative feedback, "you did not perform so good, so we are going to do it all over again". Question: Are they going to give other answers to the questions? Leads to a total suggestibility score.
The Birmingham 6 were given this test in the 90s, as is obvious is that the two men who never confessed the bombings scored much lower than the 4 who did confess. As a basis on this case study he suggested that there was some kind of relationship.

Summary

Summary – false confessions do occur, both from cause studies and experimental studies. Even in the Netherlands there are a couple of cases where we now know that there are such causes. Individuals high on suggestibility are likely to confess.

Eyewitnesses and suspects can be unreliable, we should analyze the circumstances, in particular suggestions and pressure from the police when the confession was given.

Literature suggestions

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2007-09-25: Remembering Childhood Trauma

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Adult's memory for childhood trauma

Long term memory for child sexual abuse (CSA)

There are some topics which are hard to hear about, and which might be upsetting for some people. There are also a lot of legal applications to the work talked about today.

Why is long term memory for sexual abuse important?
Legal issues, because often when children have suffered childhood sexual abuse it might take years before they disclose it. How accurate their memory is important to court cases. E.g. The high profile cases involving sexual abuse by catholic priests. Even when the priests have confirmed the abuse it is important.

If you think about your own childhood, if you had to describe an event when you were 5 or 6 years old how accurate would it be?

Another reason: In the US there is a statue of limitation, for a burglary this would be 7 years typically, if it is more than 7 years you can't be charged for the burglary, as the evidence would be too old. For some crimes, like murder, there is no statue of limitations. The interesting thing about child abuse is that some states have decided that the statue of limitations should start only when the victim remembers the abuse, even if there has been a lot of time since the abuse actually happened. This puts into question accuracy and long term memories. This is called a *delayed disclosure.*

Theoretical reasons
- Controversies over the Relations between Trauma and Memory
- Do we need to invoke Special Memory Mechanisms (repression, dissociation) for Trauma Memory?
- Does Trauma heighten Memory or hurt it (or both)?

Lots of controversies, such as do you need special memory mechanisms for traumatic events? Such as the Freudian repression mechanism. Or *disassociation*, the idea that there can be a separation of mind from body. A lot of women say that they experience this during childbirth, also in hypnosis and other fields. The Freudian idea is that you might disassociate, which might make your memory more fragmented and not a complete record.

Also if people's memory is helped or hurt by trauma. If someone stole the lecturers purse, would the memory be better from that, or worse?

Today's topics:
- Lost memory and special memory mechanisms
- Subjective forgetting – self report of subjectively having forgotten something in your past
- Accuracy of long term memory for sexual abuse.

National Institute of Justice Study: Emotional Effects of Testifying on Child Sexual Abuse VictimsGoodman, Taub, Jones, Rudy, England, Port, & Prado (1992)

1986-1988: Emotional effects of testifying on child sexual abuse victims. In the US children have been mostly excluded from the court room, which have made the crimes hard to prosecute. In the 70s and 80s this changed, and the lecturer researched what the emotional results would be.

Original study stats
Age in years   Intake: 10.05 years, range = 4-17
                          Start of abuse: 8.06 years, range = 2-16
                          End of abuse: 9.00 years, range = 3-16
Perpetrator   Stranger: 6%
                          Acquaintance: 27%
                          Nonparental trusted friend/caregiver: 43%
                          Parent/Stepparent: 23%
Type of Assault   Exhibitionism: 1%
                          Nongenital fondling: 9%
                          Genital fondling/oral sex: 48%
                          Vaginal/anal penetration: 42%

Some of the children were very young, mainly involving parents or step-parents and people the children knew. Some of the cases were very traumatic, some not so traumatic.

Examples:
- Neighbor who sexually fondled 7-year-old child in his care
- Ex-con who, once out of prison, raped girlfriend's daughters and then killed a police officer
- Stepfather who kidnapped his stepdaughters and raped one of them at gun point with police surrounding the house
- Father-daughter incest: Father killed himself after daughter testified against him

Research design
- Case Referred for Prosecution
- Initial Child Behavior Checklist
- Child Testifies vs. Matched Nontestifier Chosen
- Post-Testimony Child Behavior Checklist
  - Three-Months
  - Seven-Months
  - Case Closed

If you only study the emotional effects on kids who testify, how do you do that? It can't be random assignment.
The child behavior checklist is a baseline for the child's mental health after the abuse, but before they have much legal involvement.
Then they waited to see if the kids testified or not, they measured before the court, then after.
After the testimony they picked a child which matched before so that they could compare.

Basically if we look at the emotional effects they want to know if the mental health is the same at the start of the prosecution, then you could say if that child is better after the testifying for those who testify. Is the testifying itself worse? This is a quasi-experimental design.

Main findings
- For a Subset of Children, Testifying was associated with increased behavioral disturbance
- Predictors: Multiple Times Testifying, Lack of Maternal Support, Lack of Corroboration

For most kids the mental health is worse at first. For most kids it got better, but for kids who had to testify multiple times, or if their mother was not supportive, or if the case lacked collaboration they were worse off.

Years later they realized that it would be a lot of interest to find these kids and check what the long term effects would be, not just the abuse and also the legal involvement. They also wanted to look at their memories. It was a lot of work to track these 218 people. They also added a comparison group with no sexual abuse.

The researchers had a lot of documents about the original cases, and this could be used as a validation of what happened to the child, what they called the ground truth against which the memory could be validated later.

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National Science Foundation Study: Long-Term Follow-Up

- Track Down the 218 Child Victims and their Caregivers
- Add Comparison Group (No CSA)
- Examine Current Mental Health, Legal Attitudes, and Lost Memory for Abuse

It is considered unethical to contact the subjects directly. Therefore it was broken up into several phases:

1. Check for correct person
2. Do a phone interview (paid) for legal cases. This was the first memory exercise
   a. Victimization history
   b. 3 questions about child sexual abuse, also other things
3. A questionnaire was sent out, victimization history and legal history. Maybe they didn't want to tell a stranger over the phone. Also measures of disassociation and PTSD.
4. Clinical psychologist were sent to a subset of the houses

Would the victims disclose the child sexual abuse?

Background

Linda Meyer Williams: Had the insight to do this kind of study, after a 17 year delay. She found that 38% of these women failed to disclose the target sexual abuse case from their childhood. She thought this meant that 38% of the women repressed and lost their memory. This is a large percentage, and would give a lot of credence to the Freudian repression thesis. Freud said that you don't necessarily repress the memory, it is only when it has negative consequences for yourself, because of the shame and guilt. In the US: 24% of college populations and 9% of boys could be qualified. One problem with this study is that a lot of these women talked about a lot of other abuse.

What was the result of this study?
81% disclosed the case. 17 denied ever being abused. 7 disclosed a case other than the target case. 2 were told by their mothers that they had experienced CSA.

They checked for false reports, 4 were reported as such, 3 of the boys "coaches just do things like that", 1 female might have just tried to protect her father. This was equal with or without corroboration

Important question: *how can you discriminate between someone not wanting to tell you and someone not remembering? You can't*.

	B	S.E.	Wald	df	p value
Victim Age	1.19	.58	4.22	1	.04
Victim Gender	.14	.60	.05	1	.82
Severity	.34	.16	4.42	1	.04

Mom Support	*1.39*	*.60*	*5.38*	*1*	*.02*
Rel. to Perp.	-.27	.57	.23	1	.63
Legal Involve.	.45	.32	2.04	1	.15
Ethnicity	1.92	.62	3.68	1	.06

The ones in cursive are significant. Main predictors
- *Age:* There has been concern that you'll have infantile amnesia if you were very young, usually you have no memory for this kind of memory. If the abuse happened was under 6 years of ago they would be less likely to disclose. You don't need a special mechanism for this. Infantile amnesia is interesting, because even 1 or 2 year olds have memory, it just doesn't seem to stick.
- *Severity:* A lot of more Freudian clinicans would sugget that if you've been more severely abuse you would have less memory, the findings here was the opposite, the more severe the more likely you would be to disclose.
- *Maternal support:* Basically the victims who had maternal support in their childhood were more likely to disclose. Being believed and supported makes it easier to believe and talk about it later. (80vs 68%)
  - Maternal support during legal involvement was significantly associated with increased likelihood of disclosure
  - Perhaps feeling believed, supported, and comforted results in more open discussion and thought, which makes later disclosure easier and more likely

There was an almost significant effect of race and ethnicity. In Linda Williams most were African Americans, and their non-disclosure rate was close to 30%. We can't say why, but it might be because African Americans have more trauma in their life, but when we controlled for that statistically it didn't explain the findings.

Disassociation
Dissociation = The lack of normal integration of thoughts, feelings, and experiences into the stream of consciousness and memory

Putnam's Dissociative Experiences Scale (DES):
- "Do you ever look in the mirror and not recognize yourself?"
- "Feel other people aren't real?"
- "Feel your body doesn't belong to you?"

DES was included in the mailback questionnaire

There was one finding which might have indicated a special memory mechanism being involved. This was on dissociation. If you're driving somewhere you often dissociate, because you're so familiar with driving that your mind goes other places. There is also

more pathological disassociation: "Do you ever look in the mirror and not recognize yourself". Putnam's

- Disclosure and dissociation were negatively related:
  r = -.24, n = 115, p = .009
- The more dissociative, the less likely a person was to have disclosed
- Psychodynamic clinicians have argued that dissociation during abuse leads to lost or repressed memory and that dissociation in adulthood is related to memory loss
- Dissociation also predicts false memory

People who were highly disassociative were less likely to disclose the target case. Psycho dynamic clinicians have argued that disassociation is what would make lost memory occur.

Speculation

There might be a sequence like this:
- Abuse leads to Dissociation
- Dissociation contributes to Lost Memory
- Abuse/Dissociation lead to Therapy
- Memory work in Therapy leads to False Memory of Abuse in Dissociative Clients who have Lost Memory of True Abuse
- An Innocent Person then May be Accused of Abuse they did Not Commit
- BUT it Could be Dissociation Just Leads to Lack of Willingness to Disclose!

You could be abused but have a false memory of abuse as well.

Williams had more respondents who disclosed another case, or was it the target case?

It is possible that some of the 26% of the Williams case were actually talking about the same case, since she didn't have enough documentation of the original case.

Of theoretical interest: What failed to predict non-disclosure?

Self blame (more self blame, more likely to disclose, r = .17, p < .05, n.s. in regression)
Total life traumas, r = -.06
Other child maltreatment, r = -.07
Number other CSA exps. (range = 0 to 7; 64% reported only the target case), r = .01
Frequency of abuse (target case), r = .05
Relationship Betrayed, r = .08

Summary: Lost memory / nondisclosure of abuse

- May not be as high as 38% overall

- Was as high as 30% in one subgroup. May largely indicate lack of willingness to disclose.
- "Childhood amnesia" can explain some but not all of the effect
- Severity and maternal support are associated with greater likelihood of disclosure
- Dissociation may also play a role

Another group which had a lot of non-disclosure were kids who did had not a lot of legal involvement.

Study 2: Can people recover lost memory of abuse

Cases where you've been abused and then lose their memory usually doesn't end up the legal system. Cases where you recover the memory is more likely to end up in the legal system. Ask the question: "was there ever a time when you forgot about the case?"

The Eileen Franklin case: When she was 8 years old her best friend was murdered. When she is in her early 30s her daughter was 8 years old, and looked quite a lot like her best friend, and one day she looked into her daughters eyes and the memory came back that her own father was the murderer of her best friend. She was in a car with her father, in a van, and gave the best friend a ride, then took them to the mountains, raped the girl, hit her in the head with a rock, then told Eileen to never think about it again, and she did.

Can this happen? To repress a memory like that, and would it come back like that? The dad was convicted about it, then released on appeal, as cognitive psychologists found that there was no. The dad had a long time history of domestic violence, abuse of Eileen, he was found with child pornography under his bed. You never know in these cases what the truth is, but it raises interesting questions.

The Ross Cheit case: a professor at Brown. At 36 years of age he remembered previous non-remembered molestation of a counselor at a boy camp. Because he was an attorney he knew what to do, so basically he searched and found the camp councilor, called him and tape recorded the conversation, and the councilor confessed. Some other boys also collaborated. Skeptics would say that he never lost the memory.

In the US there is something called the False Memory Syndrome foundation. Jennifer Freyd accused her father of CSA, and the mother founded the founded the organization. This became a very well known case involving psychologists on both sides.

Elizabeth Loftus: There is no such thing as repressed memory.

Research question

Do participants report having forgotten, for a certain time, their experience of sexual abuse?

- Williams (1995): 10% of entire sample reported forgetting;
- Elliot & Briere (1995): 42% reported periods of reduced memory
- Problems with how people interpret the questions asked about forgetting (not thinking about the abuse vs. amnesia/total inaccessibility)

We wanted to find out do participants in our study having forgotten, for some time, their experience of sexual abuse? Williams (1995) reported 10%. These are subjective reports of what people say about their memory.

If you do phone surveys of this you might get 42% on such studies, but you don't know for sure since you don't have the documentation.

There is also a problem in how people interpret the questions asked about forgetting. It might not be a matter of amnesia, not thinking about the abuse vs. amnesia / total inaccessibility. In these cases we try to think of "no memory".

Regression analysis: Can we predict subjective forgetting?
- Logistic regression analysis: Dichotomous forgetting variable regressed on:
- Age at End of Abuse
- Victim Gender
- Abuse Severity
- Maternal Support
- Relationship to Perpetrator
- Extent of Legal Involvement
- Ethnicity

Significant predictors:
- The *More Severe* the Abuse, the more likely the person reported Subjective Forgetting
- The *Less Extensive* the Legal Involvement, the more likely the person reported Subjective Forgetting
- *Males* were more likely than females to report Subjective Forgetting

The clinical Freudian group would say this is likely, but the story is more complicated, if we take into account how the respondent interpreted the question: We also asked the 21 people why they couldn't remember. "It was so horrible that I pushed it out of my mind", the aftermath of trauma. How do these reasons compare to what really happened to these people? You can look at a correlation .47, people were pretty accurate when they said it happened so lot. Same as the more severe cases. People were pretty accurate to why they might have forgotten the abuse.. With more severe abuse the victims might be more accurate, but did they really have amnesia for it?

"Would you have remembered the CSA if asked?" The 5% who might have had a repressed memory that they recovered later. That is so few case that we can look through all the cases to get a sense of what the cases were like.

Reports of reasons for forgetting (N=21)
- I felt afraid, and I didn't want to think about it (86%)
- It was so horrible that I pushed it out of my mind (81%)
- I did not think about it and eventually I forgot (57%)
- It happened so often that I can't remember it all (57%)
- I was too young (38%)
- I don't know why (38%)
- I did not think it was important (14%)
- HOW DO THESE REASONS COMPARE TO WHAT REALLY HAPPENED?

Do reasons for subjective forgetting relate to abuse characteristics?
"It happened so often that I can't remember it"
$\qquad$ Frequency, r = .47*
"It was so horrible that I pushed it out of my mind"
$\qquad$ Extent of sexual contact, r = . 47*
$\qquad$ Frequency of sexual contact, r = .41t
$\qquad$ * p < .05 $\qquad$ t < .10 two-tailed tests
$\qquad$ Frequency: 1 = once, 3 = more than 3 times
$\qquad$ Extent: 1= exhibitionism, 4 = penetration

These significant correlations indicate that there may be some truth to the victims' claims about why they "forgot."
For instance, when the abuse is severe, the victims are motivated not to think about it, to avoid their memories.
But did they actually have amnesia for the abuse? Maybe they just don't interpret the question the way researchers mean it.

Would you have remembered the CSA if asked?
15 responded affirmatively
5 responded negatively
1 responded "I don't know"
Thus only 5 people (3.5%) who disclosed indicated that there was a time when their memories were inaccessible (if count "DK," then 5 people, 4.2%)

Descriptions of stories of people who had a time when they couldn't remember

1. A boy who, at the time of abuse, was 13 and in a group home because of mental problems. The alleged (female) perpetrator was a worker at the group home. He testified at trial; she was acquitted. We interviewed him in jail. Going to court brought the memory back.

Kids who had abuse histories, and had enough problems that they couldn't be put in a foster home, this was a kid who had a lot of problems to start with. He remembered after going to court again (got a life sentence at 16 for trying to murder the mother of a friend together with some other friends) – all in the group home turned against him, he tried to suicide, also he was on drugs, this made him repress it. This wasn't a memory coming back in the therapists office

2. A girl whose abuse by stepdad was severe (penetration) and ended at age 4. Prosecution started when she was 7 years old. The case was dismissed because she refused to testify. There was no corroboration. Older brother reminded her. Says she remembered details of the abuse when she was 6 but does not remember details now.

The memory came back when she was 6, so again, the memory came back in childhood

3. A girl who up to age 8 experienced severe abuse (penetration) by her alcoholic father. Mother was dead. The girl was then in foster homes. There was medical evidence, and father had a past record of child sexual abuse. She never went to court; a plea bargain was reached. DK.

Didn't remember how the memory came back.

4. A boy who was abused (penetration) by his babysitters/neighbors (male-female couple). The abuse ended at age 5. Report to police at age 7. He went to the courthouse but did not testify. The male babysitter confessed, and a plea bargain was reached; he had a past record of child sexual abuse. Phone call from Perp brought memory back, and being in a child center for abuse victims maintained it.

The perpetrator called him and apologized for the abuse, when the child was in his childhood.

Repression?: "Had a time when I couldn't remember even if asked"
5. A boy who was awakened by an intruder and found himself being molested. There was an eyewitness to the assault. The perpetrator was captured and incarcerated.

Another boy was in the room and saw the intruder come in and leave. The boy said that the memory never really came back, he was asleep, so he never fully encoded it to start with.

Summary

- None of the recovered memories occurred in adulthood at a therapist's office
- Most of the recovered memories came back during childhood/adolescence
- Little evidence for long-term "repressed" memory
- People seem to misinterpret the question about "no memory"

A lot of perpetrators claim lost memory for their claims

Remembering Childhood trauma part II

Study 3: Long-Term Memory for Child Sexual Abuse

- The accuracy of adults' memory for details of CSA after long delays has not been previously studied.
- What predicts memory accuracy for CSA after long delays (e.g., 14 years)?

So far we've not talked so much about the accuracy of the children's memories. This has not been possible to study so far in long-term-memories of sexual abuse. Important: Accuracy, and predictors.

The present report focuses on the 86 individuals who remembered the abuse and elected to talk about it

The Time 2 sample of 86 did not significantly differ from the original sample of 218 in terms of gender, age, abuse severity, relationship to perpetrator, CBCL score, SES, etc. The one main significant difference is that individuals in the Time 2 sample of 86 were more likely to have more extensive legal involvement, p < .001

Clinicians were sent to 86 of the individuals who remembered the case and elected to talk about it. Pretty representative, a bit more testifiers and not. Interested in the PTSD prevalence.

PTSD: Definition and rates

- PTSD: A reaction to traumatic events in which the person responds with "intense fear, helplessness or horror."
- Primary symptoms: re-experiencing, avoidance, and arousal.
- It is estimated that about 35% of CSA victims develop PTSD

Large range of PTSD development in CSA cases, from 0 to 90%.

E. Foa: "*fear network*". You might have a semantic network of "going to class", this is a network like that, where victims are hyper-vigilant to this kind of input, which makes sense since they don't want to experience it again, and they've got this memory returning in their mind. If this is true that might actually help keep the memory alive and active for the past abuse. It might distract them from remembering other things from their life, but the memory for the abuse might be very good.

- Victims develop a bias to search for and attend to threatening information, which might lead to better memory for such information
- This bias may detract from memory for nontrauma-related information
- Preoccupation with trauma

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- If so, CSA victims' memory might be especially good, even in the long term, for CSA they experienced

- Used Modified/Emotional Stroop Procedure with sexual abuse (e.g., sex, privates, naughty) and nonsexual abuse stimuli (e.g., germs, urine, joy, friend). Have to name color in which words are printed.
- Trauma-related words are harder to ignore for adults and children with CSA histories, especially if they have PTSD; these words capture their attention more

This can be studied with an emotional STROOP test, You have people trying to read the word and just saying the color. These victims have very hard time ignoring the content of the word, they've got a lot of interference with those words, lots more than with general negative words and neutral words. Trauma related words are harder to ignore when you've got a PTSD history. You see the same with war veterans, with words like combat and bunker. Some researchers give a memory test after the STROOP test, and find that these victims find the trauma words better than people not traumatized.

- War veterans with PTSD remember Stroop trauma-related words (combat, bunker) better, that is, have enhanced recall of trauma-related stimuli (Vrana et al., 1998).
- Adults with PTSD exhibit difficulty forgetting trauma words during "directed forgetting" (McNally, 1998)

They've also got worse memory with directed forgetting tasks.

- Eisen, Goodman et al. (1999): Children in substantiated CSA cases were more accurate than children who had experienced other types of abuse in answering CSA- related questions about an anogenital exam.

We also find that these children are more accurate in answering abuse related questions. We studied children who had been removed from home, had examinations, and we then questioned the kids after the examination, and the sex abuse victims remember that examination particularly well, since it is relevant to their trauma.

Research indicates that PTSD is associated with worse short-term memory and autobiographical memory for nontrauma- related information (e.g., worse DRM performance, more overgeneral memory)

PTSD victims also show less short-term memory etc.

"Which one of these events was more traumatic" was very relevant to.

The best accuracy of memory accuracy is how many PTSD criteria you fulfill, you don't have to have all 6 criteria.

Memory coding

11 key issues which would be important in a legal case. We looked at the accuracy of this by comparing to the ground truth in the documentation from the 1980s. How accurate is the original documentation (e.g. if it was a false report), and also the way the correlation is done, there is no non-ptsd group, so there is much harder to do a causal connection.

11 CSA details coded
For example, Age at end of the sexual abuse, type of sexual activity, relationship to perpetrator
Caveats: 1) One can question how accurate is our original documentation, and 2) The study is correlational.

Some results:
How accurate would people be about the abuse? About 70% which is very good
10% False information (commission) (e.g. said rape, but the original report said just fondling)
10% Omission errors (just fondling, reported as rape)

Predictors of CSA memory

Variables of interest:
SES   --CSA vs. NonCSA as
 Age   Most Traumatic Life
Abuse Severity   Event
Relationship to perpetrator   --PTSD criteria met
Maternal Support   --Dissociation
Extent of Legal Involvement

2 groups: Those who said that the CSA was the worse that happened to them, even if it wasn't our target case. A lot of these kids had lots of trauma in their life. All are victims in this study.

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Number of PTSD criteria met (Z-score)

Note: lines plotted at +/- 1 SD for CSA-related trauma
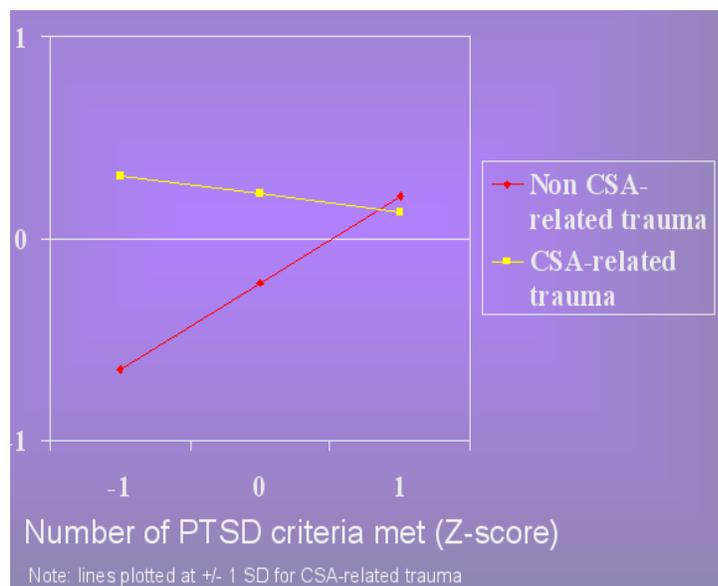
On the X axis: Correct Abuse Memory (Z-score)

Diagram of the interaction between trauma and PTSD criteria, graphed according to regression equation

Yellow line is for the group which said that CS was the worst thing which happened to them. This is not a significant drop. They had good memory regardless of how much PTSD they had. The worse it is the better the memory is. What about the people where something else was the worst thing which happened to them? If they had few PTSD systems their memory was poor. If they had a lot their memory was good.

Why the interaction effect?
- For people who said CSA was the worse thing that ever happened to them, the CSA was likely to have been highly stressful and thus memorable
- For people who said something else was the worst thing that ever happened to them and they have low PTSD symptoms, the CSA was relatively less stressful and their memory for the CSA is worse
- For people who said something else was the worst thing that ever happened to them and they have more PTSD symptoms, perhaps they are more generally focused on traumatic information. In Foa's terms, they may have established a fear network that biases them to remember trauma-related information, even trauma-related information that is not directly linked to their PTSD

Basically, even if their PTSD is something else, if they had PTSD according to Foa it makes you hyper-alert to trauma information, so it keeps that other memory alive too. Another possible explanation is that people with PTSD talked about it therapy, and kept it alive that way.

Kids who was raped at gunpoint, incest made very few symptoms.
The more stress and trauma the better the memory is.

Predictors of abuse memory: The more severe abuse was related to fewer commison errors, r= -.31 (p<0.01)

Conclusion
- Being an Abuse Victim with PSTD symptoms does not necessarily mean the person has deficits in long-term memory for the abuse

- This is typically the more important forensic issue (memory for the crime itself) as opposed to for nontrauma-related information

Can't Rule out Lost Memory of Abuse or Some Special Memory Mechanisms (Dissociation) based on Our Data

Lost memory is uncommon in this prosecution sample, but most cases of child sexual abuse are not reported to authorities or prosecuted
The more stressful/traumatic the event, the better the memory (but not always)

Recently we've done some follow-ups of that study, we wanted to see if PTSD in general is connected to better biographical memory. We've got a group of CSA victims, and a control group. We give them the SAP (?) test, such as "who did you fight the most with in school". We then asked the kid's parents, and counted that as a correct score. CSA victims with PTSD symptoms remembered those things better than our controls. This fits with better memory for the trauma. Maybe it also means better memory for their childhood?

This was adults memory for trauma, now on to children's memory.

Children s Memory for Traumatic Events

In our lab we've specialized on children's memory for traumatic events. E.g Children may witness traumatic events, and a 5 year old was very able to give a detailed description of a traumatic event. Unfortunately children are not always so accurate.

There has been a lot of debate in the field if this would make the memory better or worse. Sven-Ake Christianson (1992): Stress enhances memory for the *stressor*, but interferes with memory for more *peripheral detail*.

Do we find the same effect with children? What they might consider to be a central stressor might be different from what adults would say, we find that children's memories are influenced by development factors, but also family and socio-emotional factors. Are they accurate? It depends. Children's memory for stressful experiences is shaped by both cognitive-developmental and socio-emotional factors that affect not only the completeness of their accounts, but also the duration of their memories and the accuracy of the information they report.

Memory for negative / stressful events
Typical:
- Age differences are often less than for more neutral events, even young kids can remember for long time, but they might lose it later.

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- Kids forget over time, even if they might remember the central core.
- Infantile amnesia

Socio-emotional factors

- *Coping*, how much they avoid thinking and talking their memory is worse.
- *Embarrassment* is another form of avoiding. In Sweden the lecturer was an opponent to a thesis where they had very good access to police information. The researches talked a bit about the neutral part, some of the less neutral, but they did not want to talk about the sexual stuff. Another case where the kids were kidnapped, sexually abused, then let go home. Also the Alexandria cases, the girls tended to omit at least the most embarrassing facts. There was a lot of omission about a lot of the sexual information.
- *Mental health matters*
- *Parental influences* (goes to coping)

Usually you don't have an objective record. Even when you do have it each case is different

Example: The kids would re-enact the play with dolls, but the kids would not say it.

What scientists do is to turn to laboratory research. Turning to medical procedures is very useful for this.

There are some subgroups where the more trauma the worse the memory is.

Childhood amnesia

Leonore Terr's study of memory for child trauma:

- Studied about 20 cases of documented child trauma
- Cut off age for remembering was 2.5 to 3 yrs for explicit memory
- Implicit Memory: acting out the event, personality change
- Post-traumatic Stress Disorder: Acting out the trauma in play

Explicit memories vs implicit actions for children less than 5 years old. It is hard to do research on this, so video and medical procedures. In the lab you can do mildly traumatic things like a fire alarm. After the trauma you wait a few minutes to a few days to years and compare. A week after, 2 years after, 6 years after. And you get a sense of how well the kids remember. Testing are usually started with free-recall questions "what happened when you had the medical test". You're not leading or giving false information. The problem is that kids usually are very brief, particularly in formal interviews. It tends to be accurate, but brief. "He was mean". When you ask more specific questions you get an *increase* in answers, but also in *inaccuracy*. In the lab we sometimes asks misleading

questions. "he took your clothes off", when it didn't happen, then check how many said "yeah, he did". In the lab you can't say what it takes for them to be accurate, *suggestibility*.

Frequent research paradigm

- Child experiences a documented event set up by researchers or experienced naturally
- Delay
- Memory Interview
  - Free Recall
  - Specific Questions
  - Misleading Questions

In the 1980s there were no studies of children's memories after traumatic events, only case studies. So what they did is to go to inoculation clinics for kindergarten, then ask the kids afterwards what they remember. Some kids are fine, others are just hysterical. It depends on how the kids are prepared by their parents. When we started doing this we expected that the more stressed the kids were the worse the memory was. This is based on "train a pigeon up to peck for food, then give it a variable electric food and see how much it pecked", ie arousal tests. People transferred this to the memory paradigm. Each case is different, each study is different, so how do you know what applies?

What we did was videotape the inoculation, rate the stress (being held down=6), then wait a week and test:

			Stress		
		3	4	5	6
Free Recall	Cor	3.46	3.24	3.25	5.20*
	Incor	0.00	0.09	0.13	0.00
Specif	Cor	0.70	0.69	0.66	0.70
ML	Cor	0.56	0.63	0.44	0.82*

Forgetting:

	3-9 Days	1 Year	
Correct Recall	3.50	2.32	$p < .05$
Incorrect recall	.04	.27	n.s.
Specific % cor	.71	.67	n.s.
Specific action	.87	.73	$p < .05$
Mislead % cor	.65	.51	$p < .05$
Photo ID cor	.50	.14	$p < .01$
Photo ID incor	.41	.32	n.s.

Free recall is coded in units of information. "I got a shot" is 3 units of information. It is not coding each word, but each unit of information. On average they get 3 units of information, so they are very brief. There a statistic significance of how much information they give and the amount of stress.

The specific questions are leading in a court of law. It is hard to not do this. Here they are rated in percent.

The misleading questions: This is how accurate they are. The more stressed they are the better they are at resisting the misleading questions.

This went against what a lot of experts were saying in court. What is wrong with this implication? Did high stress cause them to be better? Basically this is a correlation study, so there could be third variables which we are not studying here. There could be one or more variables: What if smarter kids get more stressed, it has nothing to do with stress? Or they have more knowledge, or personality factors, people who are more prone to being stressed have better memory. We tried to correct for this, and we still got this pattern, but you can't know for sure, since this is a quasi experimental design, you have to make the inferences cautiously.

After 1 year: They were less correct, somewhat more suggestible to false information. This is what you usually see as peoples memory get worse.

We also had a photo ID test, this went from .50 to .14, but they usually said "I don't know". Once the kids are 5 they are as accurate as the parents. But if you take out the real nurse and replace her with someone who wasn't there, then you see kids make more false identifications than parents do, this is up to 10 years.

Summary: *positive association of stress with memory, but some forgetting over time.*

Conflicting findings

Not all studies find this effect.. Partly this is based on if you test for central or peripheral information. If you stick to the central then you get the effect, but if you check for peripheral effects you get more errors, much like Sven-A found for adults. What is more problematic is that these studies started getting applied to CSA cases. So, we looked for other kinds of medical procedures which would be more like CSA:

Voiding Cystourethrogram Fluoroscopy (VCUG)

- Patient lies on a table
- X-rays are taken
- Genitals are cleaned
- Catheter is inserted through the urethra into the bladder
- Bladder is filled with a contrast medium
- X-rays are taken
- Patient is instructed to void

Safe, Fast Restraint for Frantic Patients

Kids who have urinary tract infections, or excessive bed-wetting, doctors some times want to take this test, as it could be a problem leading reflux, where urine goes back to the kidneys leading to kidney failure. In Buffalo they were way overdoing this procedure. This procedure is not very pleasant and a bit like rape. There is no euthanasia, the parents are forced outside of the room when the catheter is inserted. The doctor We were permitted to video tape the kids. Not all the kids became hysterical, but a lot of parents didn't even know what the procedure was like. Some of the research assistants couldn't even be in the room.

What would be the kids memories be like? Some parents told the kids to not talk about it with other kids, and so on. Are there age related changes in the completeness and accuracy of children's memory for stressful genital contact?
Cued recall is a bit more restricted, such as "what did the nurse look like?" We also asked more specific and some misleading questions.

The memory for the event was just as good if they had one or more of these procedures.

I.   Short-Term Study
46 children, ages 3 to 10 years
Researchers observed children undergo the   VCUG and documented what occurred
Delay: 1 to 4 weeks

Research questions:
- Are there age-related changes in the completeness and accuracy of children's memory for stressful genital contact?
- Are there important individual differences in children's memory for stressful experiences?

Memory questions:
    1. Free Recall and Cued Recall Questions
    "Tell me what happened the time you had the test with the tube."

    2. Specific Questions

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"Did anyone hold you down during the test?"

Methodology:
Subjects (N = 46)
17   3- to 4-year-olds
16   5- to 6-year-olds
13   7- to 10-year-olds
Number of VCUGs (range = 1-6)
29 children: 1 VCUG
8 children: 2 VCUGs
9 children: 3 or more VCUGs
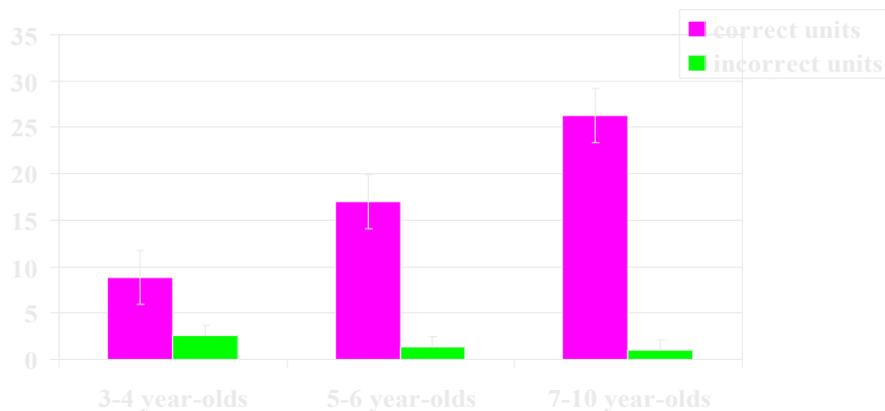
(x axis: units of information)

Free recall bar-chart. 7-10 year olds are able to tell you much more, with even less incorrect for older kids than younger. These kinds of age patterns are very typical when dealing with stress and not.
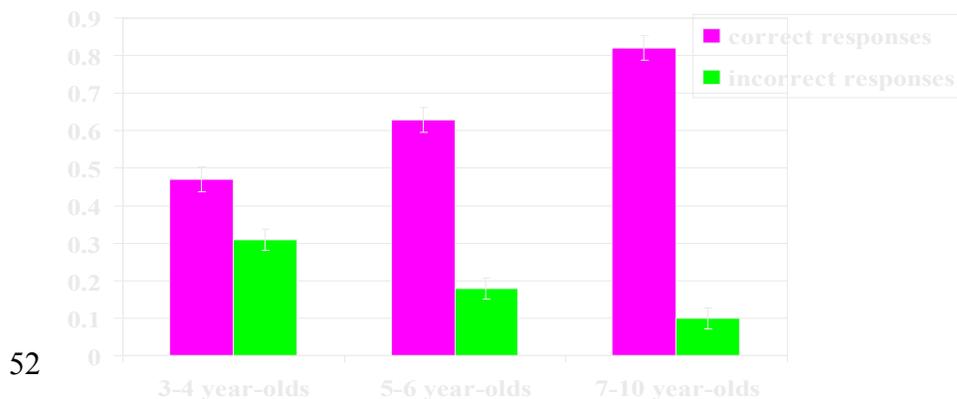
For specific questions you get a similar kind of age pattern. But the error rate is higher, which is the danger of asking 3-4 year olds specific questions.

Another thing we noticed is that this is a bit similar to the Strange Situation, it is used with 18-20 year month old to assess infant parent-child attachment. It asserts how secure the kids are with the parents, how responsive the kids have been to their parents

Bowlby attachment theory and children's memory

Bowlby was trained as a psychotherapist in England, and studied the attachment between mother and child. Also interested in animals, it is essential to bond with the mother. This is very evolutionary adaptive, kids try to get their needs filled by their parents. What Bowlby hypothesed was that how the parents responded when the infant is needed is that the infant is building up working models of how people are. If the parents are nice they expect that people are nice, at the same time building up an idea of self – "I'm a person worthy of being loved". If the parents are not responsive, hostile or inconsistent, then the child is building internal working models about the world "you can't rely on other people", and "I'm not lovable", something you want to avoid.

- Bowlby emphasized the importance of parent-child relationship for child's mental health
- Ethology—Realized that for many animals and humans, staying close to mother is essential for survival

Anisworth's theory:
- Infants seek proximity to their caregivers for protection and comfort
- internal working models of self and attachment figures are formed depending on the caregiver's responsiveness to the baby

Individual differences in attachment organization:
- Secure. Seems confident that parent is accessible and responsive. Is competent, exploration-oriented, and affectively positive. Soothes easily. Shows early empathy, communicates clearly about feelings. Solves problems effectively. (Origin: sensitive, empathic caregiving; coherent discussion of emotions.)
- Anxious/ambivalent. More crying, separation anxiety, and anger. Lacks confidence that parent will be accessible and responsive. Vigilance and preoccupation interfere with exploration. Attachment behavior has low threshold for activation. Fussy, angry, immature. (Origin: parental anxiety and uncertainty, insensitivity to child's signals, intrusiveness, inconsistency.)

- Avoidant. Cries relatively little during separation and actively avoids parent upon reunion. Engages in "displacement" exploratory activity, "turning to the neutral world of things without the true interest of exploration." (Origin: parental rejection, coolness, discomfort with negative emotions and physical contact.)

Another thing about secure is that parents aren't afraid of negative emotions, and help them process these negative events. This is important for memory.

The anxious/ambivalent, the kids are more anxious about the parents leaving, more angry because the parents are less consistent. This is supposed to derive from the parents being inconsistent and some time…

Avoidant – the kids have learned to busy themselves with other things when the parents leave, this is not true play.

These are the three original attachments Bowlby

Disorganized "D" attachment

Disorganized babies
- Tend to show strange behavior at reunion (lie down on floor stiff as a board, starting to approach and then looking like they are going to scream and walk backwards)
- Mary Main & Judith Solomon ("D"), and Patricia Crittendon ("A/C")

Disorganized babies – this is related to the parents being traumatized and often depressed, and also where there is CSA.

In the strange situation you have the main caregiver and the baby come to a room, they play for a while. Then a stranger enters the room. And you see how the baby reacts, then the mother leaves, how the baby reacts, the most important is how the baby reacts to the mother returns. The secure babies cry when the mother leaves, but are easily soothed. The anxious want to be picked up, but then they start hitting the parent, they don't resume play. The avoidant kids tend to try to ignore her, and they tend not to cry as much. The disorganized babies have not been able to figure out their parents, so they show really strange behaviors. This is associated with mental health problems when the kids grow up.

Type A: Avoidant: 27%
Type B: Secure 63%
Type C: Anxious/ambivalent 10%

"D" (disorganized) classification:
About 10% of babies in U.S. samples are D
D babies tend to have parents who have history of trauma/child abuse or unresolved grief

Dante Cicchetti:
- Even abused children are typically attached to their parents
- Maltreated babies:
    - About 80% are insecure, including a high percentage of D babies

Back to the VCUG procedure

This is similar, but much stronger. The attachment test is for very young children, but you can use the attachment classifications with adults, like with romantic attachments. The attachments from your infancy might be following you. This can be measured with self report measures for adults, so you can classify the adults:
- Hazan & Shaver's Relationship Questionnaire
    - Parents rated their similarity to 3 attachment styles
        - secure
        - preoccupied
        - fearful avoidant
- Post-VCUG Communication Questionnaire
    - Parents indicated whether or not they
        - explained VCUG to child
        - discussed VCUG with child
        - physically comforted child
        - had no time to attend to child

The more secure parents took time to discuss the procedure, they're best at dealing with the negative emotions. The less secure didn't have time, didn't want. This is not good for the kids memory.
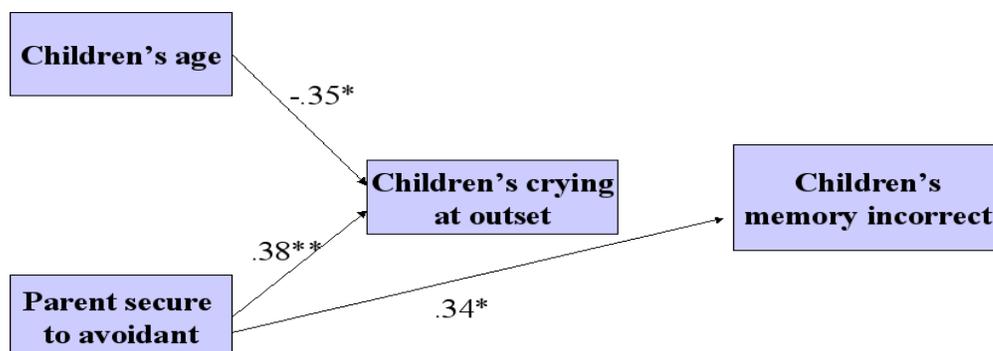
*p < .05. **p < .01. ***p < .001.

Normally age would predict how accurate the kids are. Younger kids are also more stressed. The younger the kids are the more they cry, as age goes up the amount of crying went down. Normally you would expect to see a line between age and inaccuracy. But basically, when you take the parents security into account the line is not there any more. The more avoidant kids cry earlier "people aren't safe and they'll hurt me". How avoidant the parents was also predicted how accurate the kids were.

Avoidant parents:
- Didn't prepare their children for the VCUG
- Are less supportive during stressful events, especially as the stress gets higher
- Spend less time after talking to their children about it
- Spend less time after helping their child cope with their emotional reaction

Basically avoidant parents weren't preparing the kids, not comforting and not discussing. The kids memories ends up being worse. The more secure parents comforted and communicated more.

This has been replicated 5-6 times: The more insecure the parents the worse the kids memories.

Bowlby: If you're avoidant you don't want to attach and express negative, you get a "defensive exclusion" effect. Remember the last lecture – about PTSD having better memory. In the avoidant kids the more stress the worse the memory. If that is true, think back to the CSA victims, those who score high on avoidance and had severe abuse would be less accurate:

Basically the kids who went through court and we looked at the memory of abuse. If you look at the high severity cases vs the low severity and look at how accurate they are what you see is that the real CSA victims who scored low on avoidance for the more severe abuse their memory is pretty good. For the victims who were more avoidant in adulthood the more severe the abuse is the worse is their memory, probably because they didn't want to think about it and deal with the bad memories. This is as Bowlby would have predicted.

The rehearsal of discussing things might help keeping the memory alive.

Individual differences in trauma memory: Attachment theory

Individual differences in attachment may be an important moderator of the extent to which threatening information is attended/processed
Avoidant individuals, who are uncomfortable with closeness and intimacy, are theorized to limit the processing of potentially threatening information, so as to prevent activation of the attachment system

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Results: CSA victims scoring high on adult measure of avoidance show worse memory for SEVERE CSA. Victims who score low on avoidance show the beneficial effects of trauma on memory.

Memory in adults with CSA histories: Individual differences

- CSA victims who score high on avoidance indicate they have talked to others less about the victimization
- This may indicate defensive avoidance at the rehearsal level
- Some individuals may have a defensive response in the face of or after trauma/negative events, whereas others may have a more orienting/ attentive response

Children's memory for VCUG

II: Long term study
- 43 children, ages 2 to 7 years at VCUG and 3 to 13 years at interview
  - Parents provided information about what occurred during their child's VCUG
  - Delay: 8 months to 6 years
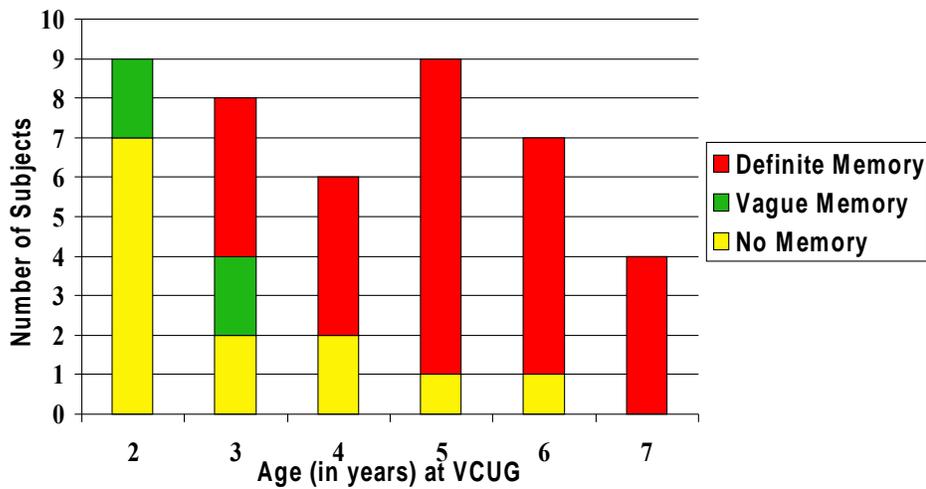
Eisen 1998

- Studied several hundred children in intensive child maltreatment investigations
- 5-day in-patient ward in Chicago
- Anogenital examination on Day 2

- Memory tested on Day 5
- Measures of mental health

In the studies so far we've looked at trauma and children, examples from inoculations, the VCUG studies, but we still got criticized that it is still not enough like CSA. Are the pretty neutral interviews we're giving the kids different from the police giving the interview, where there is a bad person doing something wrong, there is a forensic context. What we found was the kids were pretty accurate, maybe in a different setting it would be different?

In Chicago 700 people were moved from their home because of allegations of CSA, put in 5 days at a hospital for examination (genital examinations, psychiatric evaluation, the district attorney would come in.) Across all these interviews the kids were asked all the time about child abuse, child abuse. We were able to come in and record what happened to them during the genital examination, then look at the kids memory at day 5 when they usually were sent to foster parents. Again, a very traumatized population. These kids were pulled from the projects, trained from childhood to hide in the bathroom when the shooting started.

	3-5 Yrs $\underline{N} = 106$	6-10 Yrs $\underline{N} = 151$	11-16 Yrs $\underline{N} = 59$	Total $\underline{n} = 316$
Mean Age	4 Yrs 1 Month	7 Yrs 9 Months	12 Yrs 4 Months	Overall $\underline{M} =$ 7 Yrs 8 Mths

The age rage was from 3-16. In a study they had their blood drawn, looked at the throat, etc.

There is a lot of of concern that abused children would project the abuse into a neutral event. Basically we asked them abuse related questions such as "did the doctor take your clothes off" (the nurse did). Again, you see a pretty typical age pattern. The main error did by the kids is omission, the kids tend to leave out "did the doctor touch your genitals" (the right answer was yes). Even these 3-5 year olds were able to keep their accuracy.
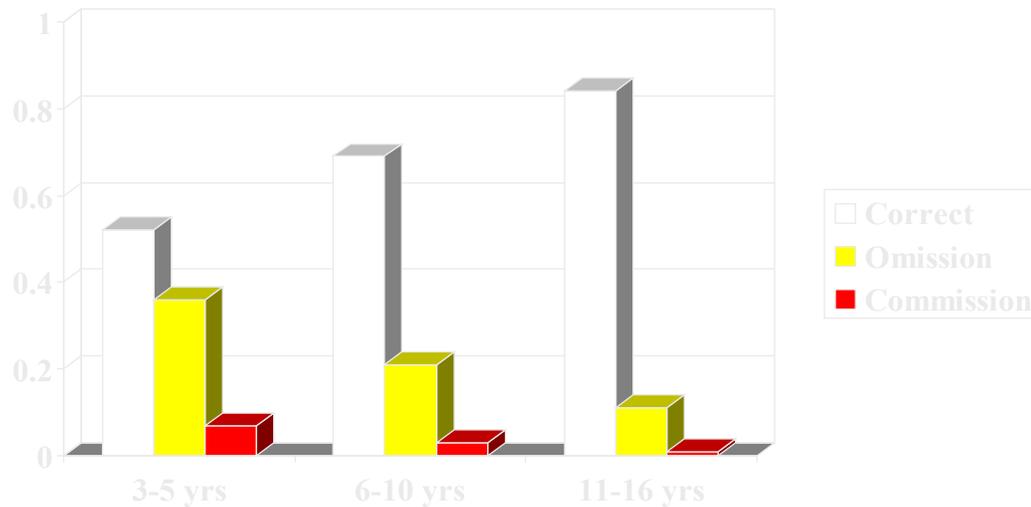
A place where the CSA victims were able to answer the analgesic examinations which were related to the trauma.

The dissociative kids had worse rate, they went along with what the interviewer asked, they said "yes yes" to the questions.

Study in Chicago
- Abuse Status did not predict children's memory or suggestibility
- Children's Mental Health was related to accuracy
- Children who were rated as having worse mental health made more errors
- PTSD did not predict children's memory or suggestibility

False memories

So far: The kids can be pretty accurate, but there are situations where kids can be very inaccurate, so it is also important to be able to study false memories. What we and others have found is that *it is easier to get a false memory about a positive event than a negative event*. E.g. having your pants pulled down in a store vs going in a hot air balloon. But, it is still possible to get false memories about negative events.

Ceci et al:

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Question repetition was not enough for a significant increase in false assent
Multiple suggestions were required (e.g., "Your mom told me that you did these things", "make a picture in your head"

Steven CC and Margaret.. specialized in false memories in children. What they found what that question repetition with false information you can get false memories. They first asked their parents about things they really did in life, they had negative events like falling off a bicycle and going to the hospital to get stitches. They also had neutral things and positive things. Basically these kids, esp when you repeat it over and over, and give them multiple false suggestions. Even from the start about 40% of the 3-5 year olds say "I went on a hot air balloon", only 18% say yes about the negative situations.

At the 12th interview they switched the interviewer. At the first 11 there were the same interviewer. With the new person the kids are not showing as much suggestibility. One thing which is important from a theoretical perspective is that if it was a true false memory you wouldn't display this, it is a social demand effect. But, it doesn't make it go away. Another thing is "your mom said this happened", which is a strong suggestion.
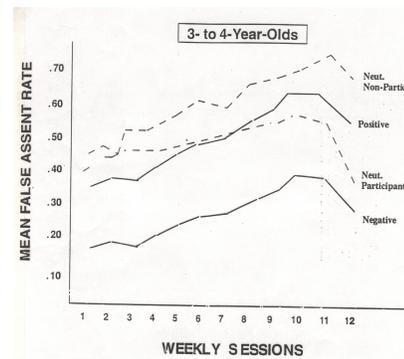
The 5-6 year olds did better, but show the same pattern.

Basically, in some of our studies too we've seen if we looked at if we can create false memories in just one session. We ask the parents what they've experienced, then we ask "tell me about the time you got in trouble for throwing the brick through the window", "was your mom there when you threw the brick", "did you get in trouble"? This is what they do in some forensic interviews, they keep badgering the kids. What we find is that with the 5-6 olds, you can ask about 6 times, then they cave in. With the 3 year olds it takes about 3 times, they answer "was a big brick? Yes!". Is this a false memory? The problem is that this happens in the real cases, if the interviewer is too suggestive, the kid will go along with the interviewer, then there is a concern that the kid will actually start to believe. The fear is that it will start at social compliance, then become a real false memory.

- Repeated interviews can help memory
- Single or repeated multiply suggestive, misleading techniques can hurt memory, especially in young children
- These results are affected by strength of the memory representation

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In the 80s and 90s when CSA become important. Some people with religious beliefs started interviewing people in very heavy ways about satanic ritual abuse. The picture has been used for interviewing kids. The idea is that there are non-human people who have infiltrated everywhere and does a lot of CSA. The idea is that it is a little bit ambiguous, and if the kid wasn't been abused it wouldn't know about this. For adults as well, if depressed and drugged patients were hypnotized and asked about this. The idea is that there is satanic abuse in childhood, then multiple personalities and repression. The kids had something comparable. 50 000 babies where allegedly being abused by Satanists, and a lot of other weird claims.

- Adults and children recalled horrific abuse at hands of Satanists
- Multiple Personality Disorder (MPD)
- Murder, torture, sexual abuse, eating babies
- FBI could find no evidence
- Repressed-Recovered memory often claimed
- Concern that therapists were using highly suggestive techniques, including drugs, hypnosis, and attributing many problems to "nonremembered abuse"

This was all playing into the whole repressed memory thing in the US. We had a grant to see if there was any evidence if there was really any of this kind of abuse. We found a lot of evidence of very suggestive interviewing techniques.

Conclusion

Children's memory for stressful experiences is shaped by both cognitive-developmental and socio-emotional factors that affect not only the completeness of their accounts, but also the duration of their memories and the accuracy of the information they report.
Are children accurate witnesses? It depends on many factors.

2007-10-08: Remembering names

Tim Brennen

Everybody considers themselves bad at remembering names. There is also an ethical side of this, a few years ago there was a big news case about an Israeli army colonel being interviewed in Israel about a soldier being killed by friendly fire. During the course of this interview the colonel forgot the name of the soldier. It was deemed unethical to forget the name of somebody. What Tim would say is that we should be a lot more forgiving about forgetting names.

Embarrassing? Maybe, but in general we're good at remembering who they are. We see someone on the metro, and we know who they are. That is more important, since it steers the conversation, the name doesn't matter for what you talk about.

Tip-of-the-tongue state   (TOT)
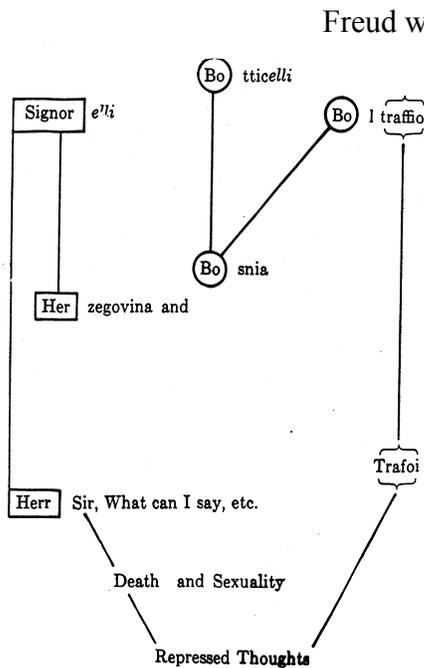
Freud was one of the first to really look at this phenomena, of feeling sure that you know the name, but being unable to recall it. In chapter one of psychopathology of everyday life he wrote about the memory for names, but the approach is very different from today.

In cognitive psychology one tries to create models which are applicable of "how it is in our heads", which are general to many situations. This is Freud's model of one particular TOT situation that he had: He was unable to remember the name of the Italian artist Botticelli. All he could he think of was Signor(elli). Then he had a long account of the connection between these two names: He was on a train journey where he talked to a Turkish gentleman, what do you say? This model may or be correct, but it is rather difficult to prove for any)T state. It is an fascinating approach, it is cognitive in its information processing way of thinking, of course also with the psychodynamic approach. It captures one aspect, that you get on keep on getting "an intruder" instead.

Signor | e^{lli}
Bo tticelli
Bo l traffio
Bo snia
Her zegovina and
Herr Sir, What can I say, etc.
Death and Sexuality
Repressed Thoughts
Trafoi

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Characteristics of TOTs (since the 1960s)

- Imminence, the word appear to be just around the corner. ("Truende Nærhet") If you've just forgotten the name it is not a TOT.
- Frustration and irritation.
- Partial knowledge of unavailable targets, you might know it is a Swedish word, or it starts with Pi* or something, but without being able to produce it.
- Persistent intruders, like in Freud's example above
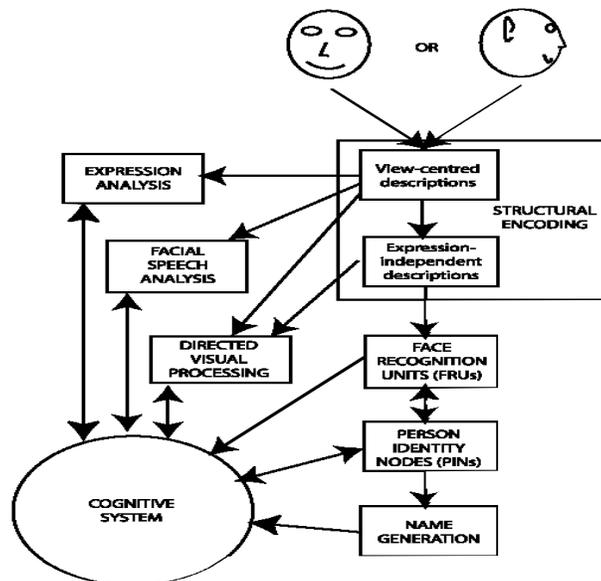
This model is from Bruce and Young (1986). The idea of this model for face processing is that we can look at different ways of processing a face. Different face tasks are processed in parallel. First we have structural analyzing. Then things happen in parallel. Expression analysis, like lips… What we're going to talk about here is personal identification. Since 1986 a lot of studies are shown that these tasks are done independently, through patient studies of people with specific brain damage.

According to B&Y is the first stage with memory of *facial recognition* is a face recognition stage. The idea is that we have units of face memory. Nice solid knowledge of familiar faces, fewer units for faces that are less reliable. The idea is that we match what we see with the stored units if the face we're looking at matches we get a sense of familiarity. This is independent of who the person is, we get this from the person identity nodes. All information is stored here, except for the name. We can only go from face to name through *personal identity* (semantic information about that person). "oh, he is that actor who was in Top Gun", but only when you get down here you can say that it is Tom Cruise. A TOT is a blockage between Person identity nodes and names..

The person identity nodes are amodal, which means it doesn't matter how you identify the person, you get access to the same semantic information. That is the dominant view in cognitive neuroscience. You don't get access to different information if you heard the name or saw it. This means that if you read out information, like for Tom Cruise, "who is the actor who played in Top Gun and was married to an Australian actress", you might get access to the person identity nodes, and get a TOT state. If you're in a TOT state induced in that way it shouldn't help you to see a picture of the face, as you already is in a TOT state.

BBBB90

To Tim it didn't seem that this model was right, so he did an experiment.

Does seeing the face of a person aid resolution of a TOT. (Faces and famous landmarks around the world)

Subjects were given Trivial pursuit type questions, such as "What is the name of Frp's leader"? Some doesn't know at all, but in some cases they ended up in a TOT state. Then we did three things:
1. *Repeat* the information, the control state
2. Gave them a *picture* of the face or the landmark
3. Gave them the *initials* of the people in question. (We assumed that would help que the name)

You're trying to describe the landmark, without giving to much information.

What helps you retrieve the name? *Only the initials help!* A picture is no better than the control condition. Tim's intuition was wrong, and the model was saved. That is easily explained in the model, as visual information isn't going to help you. This was similar for faces and pictures. The picture uniquely identify what we're looking for, the initials doesn't, but still the initials helps a lot. What people say is "I know what he looks like, but not his name".

Now on to learning new people

(Faces, then faces with names and descriptions)

What you've just done is to recapitulate McWeeny 1987: What tends to happen is that the professions are done first, even if the name is given first. You've got unfamiliar faces, you tell people a name and profession, you have to learn both, sometimes they can't remember either, but some times they remember one, then it is overwhelmingly profession, on very few occasions they remember the name and not profession. What is a nice little twist they including "*ambiguous*" names, like "baker, butcher", where a profession can also be a surname, and exactly the same magnitude was found there. *It is harder to remember that someone is named Baker than they are a baker.* This rules out

other explanations, since they're the same label. Previously a theory has been that names are easier to imagine. What this study showed was: It is not the label, but what we *do* with the label when we get it. One doesn't do the label -> face thing with names, one does it with profession. On an anecdotal basis the Europeans are generally lousy at remembering names, the Americans are better, they repeat the names all the time. It is what we do with the names which is important. The processing that the label triggers which is the key here. *The baker/Baker paradox.*

That probably isn't the only explanation either, but it is neat, since it rules out so many other explanations.

Other ways of getting the wrong name.

Anecdote from a speech therapist: "Jeg venter på en locomoped"

Another type of TOT (Schwartz' illusory TOTs)

- "What is the name of Mercury's moon?"
- "Which Swedish author wrote Den siste bøtta ?"
- "What is the capital of Bormea?"

He asked people general types of questions with no answer, and found that people some times ended up in TOT states. The interesting thing is that subjects some times will report TOT states.

He called them illusory TOT states. He got people to rate them for frustration and so on, and they were just a bit less than the real TOTs.

What Schwartz said is that some TOTs or a component of TOTs are *metacognitive judgments*, they are judgments that you should know this word. 10 years ago you read a lot about astronomy, therefore you should know the name of Mercury's moon. Not all TOTs reflect problems of lexical access (lexical access = access to your mental fiction). Up to now what we've been talking about assumes that TOTs reflects difficulties in name retrieval. What Schwartz showed was that some TOTs are about metacognition, *not all TOTs reflect problems of lexical access.*

Persistent TOTs (we filled out a survey about this earlier)
Quite a few people claimed to have a similar thing, where one particular name had the same problem. This is quite odd in terms of lexiacal access, where the main principle is that the more frequent a name is the easier it is to recall. Words you recall a lot come out more fluently. This is the problem with names which you don't recall a lot. The persistent TOT can't be explained at all in terms of the metacognitive approach, since you know that the target exists. Maybe in a year we can tell you more abut these.

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Does everyone have TOTs?

Schwartz has done some interesting work on does everyone have TOTs?
Yes, everyone does. He did a survey of mother tongue speakers of 55 different languages, who also spoke English. "In your language is there an expression equivalent to TOT?" In *all 55 he found that yes*, they do have an equivalent. In all European countries there is. "sparkling at the end of my tongue" is what you say in Korean. The expression seems to have emerged independently.

What does universal mean? Does it mean that every single person on the planet have it? When does children have it? *Elbers (1985) reported it in a 2 year old child* (dolphin vs the word for soldiers). This does not mean that you can generalize, but it still interesting that very young children have TOTs. Another challenge is that there is a difference between the *expression* (words) are universal and the phenomenology is universal: Tim's Guatemala data: In Guatemala there are 21 different indigenous languages, in Guatemala they stayed at a city where the speak *Q'eqchi'*: None of the 21 languages had an expression for TOTs. They also asked about the phenomenology, and yes, they had the same feeling. This languages does not seem to have an expression for it, but people report the phenomenon.

E.g. To say Guatemala without 'G'. What illiterates do is to repeat the whole word again, and then say G. We tried this with sentences. "The chicken eats corn", without the word "corn", they can't do it. For us we activate our autographic (?) representation. Illiterates have less ability to reflect on language because they can't read. *We can link that literacy to the existence of TOT expressions, as literacy means that you can reflect on language*
→ We believe that it has to do with very low literacy rates, there are very few who can read and write Q'eqchi', more can read and write Spanish, but most can't. There is much less *meta-cognitive reflection*. (We think – we now claim that there are real TOTs but no expression)

Why are names hard to remember?
- Cohen came up with a related idea: *Meaninglessness* of names. When you learn that someone is a baker you trigger a semantic baker net, but when you learn that someone is called Baker you don't activate it because he isn't a baker.
- *Low frequency of usage*, what you use is easier to retrieve, you get a fluency of usage
- *No circumlocution*. For a proper name you're trying to get to one specific label. If you can't get to it there is no other proper way. If you're trying to remember "what is the name for this" Jeans, trousers, bukser, pants, etc. There are many ways to say this, so many TOTs are hidden. For proper names you either say Ronald Reagan or you're wrong.
- *Plausible phonology*: What we know of the process of recalling words is that it happens bit by bit, it is not an all or none process. Imagine that in our head,

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unconsciously, you get ba_er, and you're looking for what it could be. What I would claim is that the situation is different for names and other categories, like profession. If you're looking for profession the only thing which can fit is baker. Anything else sounds a bit odd, but you wouldn't think that if it was a word. The idea is that there is a bigger range of phonologies for names. We accept almost anything for names. Through our names we carry on learning new names, particular for people. The point is that we learn new names, and we accept them, whereas for professions and furniture our knowledge. Names are more *computationally intensive.*

People have suggested these various explanations for why names are hard to recall, but it is unlikely that there is a completion between them. It is likely that people names are at the sharp end of many difficulties.

Next week: After brain injury people names are hard to recall.

Can we make them easier to remember?
- *Imagery mnemonics* – this is really prone to semantic errors.
- *Demanding*. There are only a few occasions when it is really important to remember someones name, like at your wedding.
- Practice is the main thing, repeat your name.

Jacoby's "false fame" effect

This is not about retrieving names, but he gave lists of names to look at while they were performing another tasks (a dividing attention task). Then the following day they are asked to do a fame decision task to names, e.g. distinguish between names of celleberities, ordinary names, and names from yesterday. You're much more likely to say the last category as celebrity. People are more likely to do a source monitoring error. This is name recognition rather than name retrieval.

Young, Hellawell & Hay (1985)

What people were asked to do was to name the top half of a composite face. What they found was it was quite disturbing to name the top half of a face. What they found is that you take much longer when the lower half is adjusted to the left.. names naturally form a gestalt, our whole perception is geared towards that. When the lower part is adjusted it breaks the gestalt. This is neat evidence that it is a gestalt, you're not recognizing "Per Foss eye".
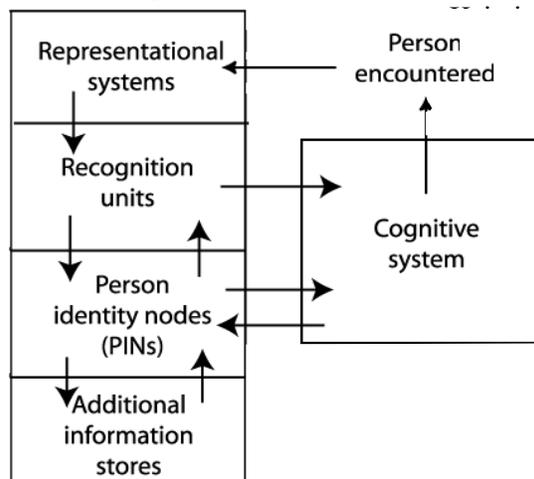
The Thatcher illusion (Thomson, 1980)
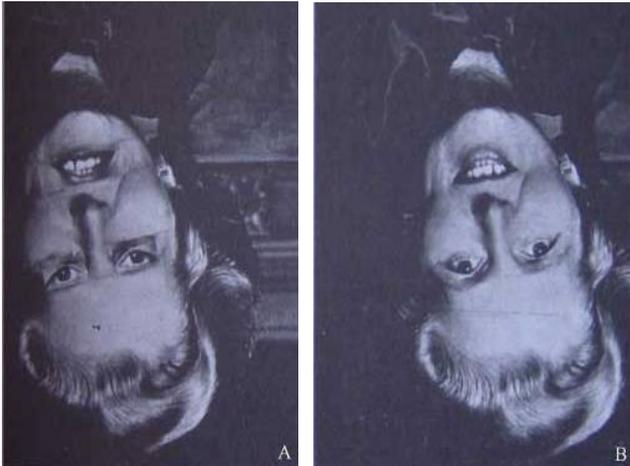
We're much better at right way up, upside down we're not really good at. We can't pick up how grotesque it is the wrong way up.

Next time: last lecture!

2007-10-15: Remembering names after brain injury

Last week we looked at problems remembering names.

There are particular problems with remembering names after brain injury.

First: Some wider background on the interest in names. What it derives from is research on memory more generally, in particular memory for faces. In the 1980s it was a lot of studies of this

What in the 1980s was *cognitive neuropsychology* was the study of people with brain injuries.

Prosopagnosia

- agnosia is the problem recognizing something. The problem recognizing faces. The interesting thing is that *memory for people is intact*, they still remember who people are, if you get to the information *through another route*. Prosopagnosia is particularly profound, since they can't remember any faces, not even themselves in a mirror. "you're holding a mirror and it is a face, so it must be me", e.g. it must be me. Some get very skilled at recognizing people through this intellectual process. (Breakfast example) There are more men getting prosopagnosia than women. There is a controversy if it has to be bilateral or just right side to get this. If you get a knock on a back of the head you might get symptoms. If you still have them after *6 months* your prognosis is pretty poor. There are well documented cases that memory for objects and voices are just as good as before. There are cases in the farming industry where a person absolutely can't remember people who can distinguish between his cows. It looks like there is a center for recognizing faces, and another area which is not identical for recognizing.

Most people with p have bilateral, but there are some good cases of only right sided damage. There are other cases with only right sided in the same area without prosopagnosia, but there is no doubt that it is the back of the head. The general prognosis for the symptom is very socially destructive, you're always compensating. It can make the work and social life very difficult.

Then there is something called *covert recognition* (Bayer, 1984) to skeptical reaction. What Bayer had done with prosopagnosia is: It is true that he can't recognize faces, he can't recognize which is familiar and not, and used the *galvanic skin response,* linked up the faces, then presented famous faces, and read up names and said "tell me when it is the right name". The patient can't do this (he used US presidents). What he found was that the galvanic skin response was the *highest* to the right name. On *some level* the system is distinguishing between familiar and non-familiar faces, even on the lowest level, the name. Some colleges in Britain said "we have no feeling at all that they recognize – they

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used a name learning paradigm of famous faces. Some of the pairings were correct, and some were not correct. If the system has to learn them from scratch there wouldn't be a difference between correct and incorrect patterns, the patient learned correct patterns faster. There is something in the system which recognizes faces, but it is not available at the conscious level."

Capgras

First reported early in the first decade of the 20th century. The symptoms are that the patient reports that somebody, often somebody emotionally close to them has been replaced by an impostor. "Yeah, it looks like her, in every way, but I know it is not her". Capgras patients are often locked away under high security, because in many cases they try to kill the person. In the early 20th century they'll chop the head and look for valves, today it is silicone chips. This is about more than face recognition, it must be something deeper exotically as well, but what is driving the violence is "this person is not who they used to be". These are the extreme cases, but there is a set of re-duplicative amnesias, so people get this for their cat.

This makes people think that there are *two different routes to recognizing people*. The converse to a covert recognition from prosopagnosia above. What is working in capgras is the *hard recognition*, but what they're not getting is the *emotional recognition*. In prosopagnosia you're not getting the *conscious recognition*, but you can demonstrate at some level they get a recognition. There was always an idea to link up the capgras patients to *galvanic skin response* with the hypothesis that they wouldn't show skin reactions. For 10 years it wasn't possible to do because of them being serious paranoid, but some has actually done it now, and indeed they have extremely low reactions compared to normals. We can think of it being *two routes to recognition*, and we need ones to have both for recognition.

Is this Double association? Usually reserved for something more defined.

The hard cognitive route is supposed to be ventral, the eye signals goes back to the head then to the semantic areas, with capgras there is… (something different?)

It might not have been explored too much if this happens in normals. It is not a very common thing, Capgra was a French doctor, it was first reported in France, and is probably under-diagnosed. They call it Capgras syndrome, but it really is a symptom.

Fregoli

He was a French-Italian, also living in the early 20th century, who was a genius at disguises, an entertainer who could change clothes in 2 seconds. People with fregoli syndrome are also a bit paranoid, they think they're bing followed. It is often focused on someone they know very well, and they claim to recognize the person all the time. They

just get this feeling that they are being spied on, and this explanatory style of how they manage to do it. They are over-recognizing this person.

This is actually a case study of a person seeing film stars everywhere, every face was familiar or famous. All faces seemed familiar, not random, you could see what it was based on, but for the rest of the population it was obvious that it was not.

The point

There are many ways the recognition can be disturbed after brain injury, both prosopagnosia and capgras have *demonstrable brain injury*. In many studies it is not differed what kind of recognition the patient is bad at, so one should be quite careful in describing the problems a patient have.

This can be connected to the Bruce and Young model from 1986.

This also makes the point that when you're testing face recognition, do you mean identifying faces, lip reading or searching for people with specific … some of prosopagnosia patients are perfectly good at judging expressions, some are bad at judging expressions good at judging faces. (This is a double association?)

There is one French prosopagnosia patient who was presented with a picture of Charles De Gaulle, a famous French president, but she was completely unable to recognize him, "I don't see who it is, but I look at his mocking eyes". "Actually, it is Charles D" – "Oh, Charles, forgive me..".

What we said last week is that we look at the *recognition route, only after accessing information about the person you can get to the name*. This *hierarchy* is also what we find in the literature on object recognition: We first recognize what the object is, if it is familiar, what it is used for, only after that you can name it.

Aphasia

The general term is *aphasia, problems with language after brain injury,* the defining symptom is an *inability to remember words*. If you have no problems naming, then it is not aphasia. Tip of the tongue state are very common with aphasia patients. What has happened in the field of aphasia is interesting philosophically, as there are classic categories of patients, clinical neuroscience emerged in the late 1700th century, and syndroms such as Brocca, when they noted *patterns* in brain injury and patients. Brocca: *Left frontal lobe:* Motor control. In Brocca's aphasia you lose some control in the mouth area, you slur your words, and have left sided paralysis. They can't get their words out, and move phonyms out and swap them out. *Wernicke aphasia* is associated with a brain injury further back and other symptoms – they produce a *lot of new words,* and it seems to them that they're talking sense, which is extremely frustrating. It can after that end up on focusing on a few words: in France, a person who for every substantive and instead

used the word "car". A bit funny, but very frustrating. To him he had no insight to this state of affairs. Brocca and Wernicke are all over the world, and you can see with an unscientific approach that they are symptoms which emerge due to brain injury. (Wernicke patients tend to get better with lots of practice)

These clinical neuroanatomy categories are real, they are *real in a clinical setting*. A top clinical can often after 5 seconds what the brain injury is. These categories are real and important in the clinical situation, but what happened is that they were used to study the average within each group, and lots of interesting information was overlooked. E.g. 1966 *Goodglass naming of categories* (e.g. cacrs, fruit) in aphasia. When you look at the individual level there are massive differences, some are very good in some categories and very bad at other categories. This was ignored for 20 years until cognitive neuroscience started looking at individual cases, Goodglass' finding was confirmed: After brain injury you could have a problem naming things like "l*iving things, including things like food*", and not man-made things. Other patients had the opposite pattern. We really don't know what the answer is here, but it certainly means that the living-non living distinction is important neurologically. The dimensions which one distinguishes between living and non-living, living are more perceptual, non-living are more things we tend to interact with. One thing which doesn't really fit in wit that is that some patients who can't name non-living things can name musical instruments.

After brain injury there are cases where the only category that is damaged is fruits and vegetables, and the converse, the only category preserved is fruits and vegetables. This was a shock 20 years ago, *that this part of the brain deals with fruits and vegetables*. Body parts: You can name pictures of body parts, but not point to you nose." Action words: Not a problem with words, but just action words.

If you took a group of 20 aphasia patients you would never be able to identify this, because it would average out, but it is quite clear that *permanent semantic categories* can be lost. There are limits to this kind of research, because you just have to see what patients come in. Now brain imagining research can give much more information: If you find lots of patients, where is the same area in us? And you find very very small differences, so it is difficult to pin down with normals.

Proper name aphasias: (egennavn)
– lots of these
Semenza and Zettin (1989) they studied this patient who could tell you everything you wanted to know about celebrities, but could only name two of them. What is interesting with proper name aphasis is that it can be *all or nothing*: They can be very good at semantic access, but very bad on names. In living/non living it can be 40/80 or the other way around. They were able to show that you could *lose all ability to remember names*, which is very frustrating for patients. S&Z patients had problems with all kinds of names, countries, companies. In the 90s it was shown that if you have problem with proper name injury after a brain injury you always have a problem with proper names, but not other

names. You can remember all the country names, even generate proper names, but just linking face with a person's name they can be extremely poor.

In the early 90s this was the state of play: We knew that names were difficult to remember, both from studies of normals and from neuropsychology, that in particular people's names were particularly vulnerable. Then Tim moved to France and gave a talk at a hospital there.. "You can't get to the name if you don't get the semantic information first": "A French patient" – a person who could name patients without knowing who they are. This is a strange state – that is Jens Stoltenberg, but who is he?

(Video)

74 years old, autosognosic (unaware, little insight in her problems), had suspected Alzheimer (or suspected), low MMS (MiniMentalState score, a quick way of accessing someones mental state, a mishmash of quick cognitive tasks – she would get the date wrong by decades, typical of suspected Alzheimer)

Could name an actor, but not say who it was. "More a singer than the others"… why do you know her? Because we talked about her.. I don't mix with these people. For other persons she could name people and say who they were, but just occasionally she couldn't say who they were. It is just unlikely that it was a intentional thing.

This is against the B&Y model.. The "impossible" errors
- She named Serge Gainsbourg and Catherine Deneuve without being able to say who they were despite a long clinical interview
- And chose incorrectly on multiple choice
- Also observed for objects

We got this more often for objects, she was actually quite good at naming objects for her age, and connection.. She would be able to name all 4 things but not connect kennel with dog. She was *not able to access the semantic information*. Looking at a picture of a telephone, *saying it is a telephone, but what is a telephone*? To get out of this somewhat aggressive way she said "I don't have one of these".. She said she was unable to use it when presented with a phone. According the model the name should be unavailable when the semantic system has collapsed. What we would claim is that you get to the name through the semantic can't be correct all the time. But, it does it does not mean that the Bruce and Young model has been falsified.
- The cognitive model cannot be universally correct
- But it still provides a good model of normal performance
- People's names were preserved on single trials, for two celebrities
- This is not a case of proper name preservation
- Overall, proper and common names were equally recalled
- And therefore it is not the reverse of proper name anomia

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It is not a double association, it is not the reverse of proper name auphasia.

Hodges & Greene – one some trials they get the profession wrong, but they're not completely wrong, they might say singer instead of actress, but not tennis player.

Muggia & Papagno: Found a patient who could name Gorbatchev but would then confabulate, and make up strange explanation of who it was.

In healthy normals we've thought until recently that we get to the semantic before the name. Actor->Harrison Ford. But, for people who you know very well it doesn't feel like that with people you're with a lot. What we did was a reaction time study, where you had to classify your colleges either after status (e.g. lecturer or student) or you have to say their name. What we found in several experiments was that the *name was indeed quicker than the semantic task*, but even so it doesn't happen to us in ordinary life – if you get to the name you know who the person it, but you can chip away at it, e.g. with th Alzheimer's and familiar names. (It is hard to say what is the most salient information)

Why might this arise? What we knew from the 80s and early 90s is that when we look at people with brain injury they fit into the model. The brain injury patients had clearly defined brain injury, a part of the brain is gone. In Alzheimer's it is a very different situation, it is a progressive disease, where you lose parts of the brain bit by bit over decades, the train has time to adapt – you can get by on extremely little semantic information. There is some interesting in distinguishing between these two very different situations.

Dom Thomson (Australian researcher)

Published with Tulving in 1973 on a famous paper. The first anecdote that he tells is from when he was going about his business when the police knocked on the door and the police knocked on the door saying you're under arrest for rape. He was brought in to the station, when is this supposed to have happened – Saturday night. The television was on when she was being raped, and she confused the rapist with the person on television. In severe trauma you can make really big errors in *source-monitoring*.

The importance of context: He had an English research assistant who got the opportunity to go back to England for a short visit. Nobody in England knows that you're going back. Stand outside of your parents home, and just stand there and don't make any signs of recognition. Her dad comes out of the house, and doesn't recognize his own daughter. The cognitive process is working, but there are more processing playing in, when you know that it can't be the person then our system will block it out. In Fragele this has all gone wrong, and they're not allowing for these contexts.

The exam

Topics we've been through
You've got quite a while before the exam. I would suggest that if you haven't already read the reading do it – based on educational research, how one learns. You have lots of savings if you learn it more than one time. There is plenty of evidence that massed learning is worse than spaced learning, the same amount of learning spaced over time gives better learning.

Questions can be based on the basis of reading. This doesn't mean that the best possible answers can be answered based on the reading, but..

List of topics:
Applied cognitive psychology.

4 essays to write in 3 hours: 45 minutes each. In England it is a long exam, Norway a short exam.

All questions are either or questions. This is my way of covering more topics, so that you don't learn just one thing. To some extent it is difficult to play bingo.

Two things about the old exam questions, some can't be answered because the reading list changes, but there are not many ways of answering "how much do you remember of childhood sexual abuse"?

Me and one other colleague marks them pass/fail.

Right of appeal

3 chances – every time there is 1 or 2 who fail. 90% pass rate.

You must answer all 4 questions. Leads to this tactics: Better to spend time on your weaker questions than on perfecting the the strong ones. *Basically you have to pass all essays.*

Read, choose and plan! Don't talk generally if the question is "describe two studies"
Make 4 choices
Begin with the most difficult?
Plan your answers, try to structure what you say – what are you going to say in what order? This is a list of paragraphs.
Write in paragraphs, the syntax and layout isn't what is going to fail you. A paragraph should be telling us something, without paragraphs it is much more difficult to read.

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The amount of text can differ between questions, some are wordy and some are more concise – typical is 12-14-16 pages. The ones who fails are the ones who write 2 pages or so total.

Fallible memory?
For names? You're not punished to not being able to remember names, but author names are a good peg to hang things on. Without the names it can be unclear about who you're talking about. What is really key is that you know the logic of the studies, what were they doing, exactly, and the reason they were doing it was for this reason. The logic between the results and the conclusions, but not how many subjects and words in lists.
For English words? If you can't remember a particular word show me that you know it by using another language, have you understand