

# Child Psychiatry

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🔊 [0:00]

Good afternoon and thank you very much for coming and for the interest.

I'm honored and daunted to be in this very distinguished series of aggression of lecturers.

And many of the lecturers in the series have chosen very controversial titles.

And in a sense, so have I may not have sounded because the idea of child and psychiatry, can seem like a bit of an oxymoron, is actually mental illness and appropriate idea to think about the problems of children.

And is it true that the disorders are increasing? and are they neurobiological or social problems? And the answers I think I'll come to at the end will be respectively, "yes" sometimes, only some and yes.

It's important especially these days for a lecturer to announce any competing interest they may have, for instance drug firms and some I doubt any financial interests to disclose, but I am a child psychiatrist and I work at the Institute of Psychiatry in south London.

And so, you'll have to take what I'm saying in the knowledge that perhaps I have a best of interest in the first question.

I hope I'll be critical as well.

It is topical.

It is controversial.

These are just some recent headlines.

The first is coming because the American Psychiatric Association just announced its draft for its new classification of mental disorders.

And there are many more disorders than there used to be.

And, so there had been several headlines about there being more diagnosis in children's troubles and criticism that this is really an excessively medicalizing



approach and types of disorders like Parental Alienation Disorder or Temper Dysregulation Disorder, really are bringing into the field of pathology or in a fact is the world of ordinary development.

And then, I put this up before the recent facts about the [\*alcomb adress\*].

But this headline about born mad or made bad crime on the child where is severe childhood misbehavior coming from.

And then we've seen just last couple of weeks the babysitters apologized for the panorama program, where they made a misleading story to suggest that the drug treatment, the ADHD, was ineffective and harmful.

Highly controversial areas, girls.

## [2:55]

And this thought of a notion is, again, part of the medicalization idea, which is that, it is an ordinary part of going to school that you get regarded as having an illness and you would take a medicine to help yourself out to concentrate.

So, lots of controversy actually.

I think that controversy is hovering between two extreme poles, if I put the two extreme poles on the left-hand side, is the notion that we think particularly about the earliest psychological environment.

There's early childhood relationships that you make are the keys to your mental health subsequently.

That the keys in disorder are emotional changes, and supportive and encouraging interventions are the important one to go.

Then in the opposite extreme, we have the school which stresses the importance of genetics on the physical environment, suggesting that cognitive changes, changes in thinking, perceiving are the key and the interventions are directive psychology, like behavior therapy, and physical interventions, like medication.

So I don't care really, these are two extreme poles and probably most professionals are somewhere in the middle, but between them.

But they do energize a lot of public debate as well as professional debate.

This is my theme about how we can whether the thesis and the antitheses can ever have any reconciliation.

And particularly we take the example of ADHD (Attention Deficit Hyperactivity Disorder) because it is very common, it sits very firmly in this area between the

biology and the social.

There's been a good deal of research, which I'll be dealing with in the lecture.

And the idea is essentially a behavioral one.

It's one of the persistent, pervasive abnormalities in being able to concentrate, so people are effected by distractible, forgetful disorganized, an excessive activity, restless, fidgety and in impulsiveness, which is essentially acting without thinking, and getting into trouble as a result.

The research is following different traditions, in the more biological tradition that I was starting with, we learn and we'll come onto it with genetic influences are strong that parts of the brain especially in the frontal lobes and basal ganglia are small.


That the same structures under activate in certain tasks, and there are psychological deficits.

Then in the other camp, there will be the notion that there are great differences over time that diagnoses has been increasing dramatically over the last 20 years.

There are great differences in prevalence between countries.

In America, diagnosis it ten times as common as we do, and about 100 times more common than the French do.

That our emotional behavioral problems and performance is very variable, so there's quite respectable scientific arguments in both kind of camps.

 [6:09]

And just to clarify the idea a little bit, this is a picture from the collection of this museum, and I think probably on sale in the shop.

This is three boys and all trained from the school, and in a used car lot and they are trashing the used cars and they're having a wonderful time.

And there's a guy trying to stop them.

But the notion is, we're not just talking about misbehavior because that can have several different roots.

One root is, this is one of the boys is, what we call oppositional, that's to say, that all kinds of reasons and it may be great anger in the way he's been brought up or what's happening in school that he's deciding that he wants to behave in this particular way.

It's a settled choice.

It's a decision, maybe an unconscious one, but nevertheless, he's doing what he intends to do.

There's another boy who's rather oblivious.

For one reason or another, he's not aware of the social rules.

Perhaps he's not been brought up with clear social rules.

Perhaps he's in the spectrum of autism that he doesn't appreciate the idea that rules apply to him.

But it's essentially oblivious to the rules about going to school.

And the third, and this is the idea that we're talking about in mental health, is a boy whose impulsive, if he thought about it, if he took time to think, then he would realize that it would on the whole be better to go to school.

That's he'd stay out of trouble, he might even learn something, he might have a good time in the break.

But he hasn't thought and he followed the others and he followed the inclination of the moment.

So the idea of discontrol of the boy is the idea that mental health is dealing with particularly.

I want to begin by tracing this, the idea historically.

I am a developmentalist and I think that if you want to understand anything you need to understand its history or somewhat it seems appropriate to this institution.

I'll go on to say something about the science, both biological science and social science and try to come to a synthesis at the end about how we understand this example of a child mental disorder.

In the very early history of child mental disorder, before past 1700's childhood is pretty short, a prolonged childhood is a modern discovery and what dominates the discourse about children is good conduct.

There's a very long history about this that one of the oldest pieces of writing in existence is an Egyptian papyrus which say that the youth of today are not under anybody's control.

They're much worse behaviors than they used to be, and things are getting worse, so nothing's very new.

🔊 [8:59]

The development of ideas of childhood were becoming developed and idealized and in the enlightenment in the age of reason insanity was, thought of as a lack of reason.

So children were exempt from that because they don't have reason.

But childhood itself is counted as madness.

A lot of thinking about childhood comes with Jean Jacques Rousseau, an enormous influential thinking about childhood education, still very influential.

Children are good by nature.

They're curious and self-directing, from twelve thy rational, and education needs protection from a corrupting society.

He was also notorious because he put his own children into an orphanage, which seemed to discredit a lot of his thinking.

This is William Wordsworth and this idea that the child's father of the man that he so famously pronounced was growing throughout the century very attractive book by Sally Shuttleworth, sort of giving some of the history of this and I think perhaps culminating in this boy, this is Sigmund Freud as a child, and he's with his own father, being encouraged to think himself as he's great.

And the child is becoming, through the century, increasingly thought of somebody whose active and agent in their own life.

Possessing of reason, and therefore potentially things are going wrong.

Here are couple of the early case histories about children's disorders.

This is from, Alexander Crichton from Scotland, as a child is born uncontrollable and raving mad.

It continuous from four days old, required four adults to hold him down.

That uncontrollable fits of laughter.

Nowadays, I think we'd see the uncontrollable fits of laughter as very likely pointing at this lack of child's head full of epilepsy.

Which is indeed classic, but he was seeing this.

As an example of the nature of mental derangement, uncontrollability.

That's the essence of it, uncontrollable by others and uncontrollable by himself.

Sometimes it's painful to read the earlier accounts of the children's disorder, this is John Hasham in the early 1800s, 10 year old boy who is indulged, mischievous, and

uncontrollable.

This idea of control is being the duty of children.

Corresponding, with the increased right of children to perceive education there's corresponding duty to be obedient and to learn.

Limited attention, resistant to punishment, cruel, destructive, threatening suicide, and John Hasham regards it as incurable.

Comments he makes suggest that if this boy is the creature of volition.

The will, the impulses that arises of him receives no control at all.

### [11:59]

He is described by the effects on others, the terror of the family and rather sadly here is the comment: "when I showed to a mischievous maniac who is strictly confined.

Then he said, 'this would be the right place for me.

And I think modernize reading it this is a painful remark like many people who are very uncontrolled and feel that, he was asking for control, he was asking to be restrained and be prevented from himself.

The John Hasham was rather taking this as just confirming the notion that a childhood disorder can be an insanity and that it is essentially incurable.

So, painful to read, but also giving the idea which keeps recurring ideas about the distress and the torment and the confusion with the fits of the families of children with a severe disorder.

This Benjamin Rush, who was a great American physician and excellent observer, describing a girl who is wickedness had no intervals while awake.

I am quoting this, because he was saying that there is probably original defective organization in those parts of the body which are occupied by the moral faculties of the mind.

So he is moving away from purely model of kind of explanation, into something that is more internal to the child.

And economics, follow this as well because in 1800, most children in this country were workers or laborers of the age about seven as in many countries of the world, that's still the case.

And by 1900, most children were students and went to school and learning.

So, huge change in the role of children.



Developing in this century from a rational into people who possesses rights.

Often contradictory views, idealized, this is bubbles, painted picture by Millet with all the wistfulness of the childhood, the model for this painting instead became admirable in later in life.

He was really embarrassed by the whole thing.

But coexisting with kind of brutality towards children and neglect of the orphanages of the world councils this is of course Oliver Twist asking for more.

This kind of contradiction is going on all the time.

This is also the time in my own institution in the Bethlem hospital, bedlam, in which has considerable exhibits or used to be considerable exhibit downstairs in the museum which will reopen again.

I am sure.

During this time there was a big change in children who were coming into the hospital because in beginning of the century, they were coming in and the reasons for coming in is the next down distress or a trauma of some kind, excessive studying, and religious mayhem, excessive religion.

🔊[15:01]

Then through the century, symptoms changed.

And by the end of the century, very much coming in with the modern symptoms was schizophrenia the feeling that other people or other things are controlling you such there are magical powers around you.

So, major change in the young people's reactions to the world they were in.

Increasingly, emphasis on child care and protection from the Poor Law act which put the charge on the parish through to the Children Act which establishes the best interest of the child is being the key consideration.

So we've gone on from the idealization of the childhood and the cruelty that goes with it into childhood that become education the society is creating it and then later to the idea of childhood as a time when children are responding to strong environmental influences in the context of medicine generally.

This is Rudolf Virchow who developed all concinnity of the disease which he was wanting to get away from the idea that causes what you usually think of predominately.

In his states the cause of germs and are they calls sometimes means genes.



But he was wanting to get away from the idea because the key things to understand been what's actually the process that is going on.

What's the psychology, what's the physiology.

How that... nothing mocked.

This is Lewis Carroll mocking brain size.

Because in Sylvie and Bruno, they are professors, is essential to try to understanding of the brain.

He's also tried to make a map of the world on the scale of one inch to the inch which is over detailed approach to science.

So development of brain science is being very strong but also very much mocked.

And most histories of ADHD which I am talking about.

Begin by saying.

The German physician Heinrich Hoffman described the 'hyperkinetic syndrome' in a case report of a young boy.

Now actually this is quite untrue and people just suggest they have all seen it.

When I show you the pictures, then it will be very familiar to you about what the physician, Heinrich Hoffman, was doing because he was writing 'struwwelpeter', 'peter the slob' which is say he is a physician and the whole industry writing about Hoffman and suggesting that this is a what he's doing is abusive because he's describing things like the boy who sucks his thumb.

And the monster comes in and cuts off his thumb as a result.

So the percentage of critics says statistic cruelty to the children.

But think again, that misses the point, because he is a gregarious, liberal and a popular man.

His surname is Heinrich Kinderlieb, lover of children, and I see what he is doing, in fact he is described in the existing children's books as just too enlightened and rational, falsely naïve, unchildlike, untruthful and artificial.

🔊[18:11]

And he's much more creating this kind of idea of children as being fun from the carp, enjoying motions children as active important agents in bringing back their own world and very important step in thinking about childhood.



And this is his fidgety Phil who is one of the characters in the book and he is very fidgety and this is him upsetting the table and this is him clasped under the table to the anger of his father and the distress of his mother.

And this notion of child being the agent, and the agent that is causing the family troubles is something that will come up again and again.

This is a child who is inattentive he is not really looking where he is going and the result is obvious.

I think it's very interesting that the ground in this picture becomes the sky in that picture.

As he turns upside down and this is a same lad who is plunging into the water, a lack of forethought and impulsiveness and indeed this is a very nice subtle way of thinking about the combination of inattention and the impulsiveness that we call ADHD.

It's a very good art I think I mean you wouldn't have to compare it to the other pictures of the same time and this is from the same year.

And this is another meal time.

You can just see the differences in the graphics.

Here is another one from few years later which I put in because a little boy is being medicated with alcohol so excessive medication of children is now new thing.

So the next step is creating the idea comes with Frederick Still, in London the founder of paediatrics in this country first professor of childhood medicine.

Very reserved man except for children.

He loved children.

Particularly little girls with long hair but generally couldn't stand their mothers.

He was the pediatrician for the present Queen.

He clearly did pretty good job.

He wrote poetry, sentimental poetry I think, it was very much idealized of children.

"My garden is the garden of the children they are its heaven sent flowers."

Rather sticky to our taste.

But perhaps because of his view of childhood that he had that he was describing in

the Goulstonian Lectures culture position not very far from here.

He was describing when it called disorders of moral control, an abnormal defect of moral control in children.

He thinks, well there maybe abstruse problem for the psychologist.

I think he means the Freudians at this point to puzzle over.

What he is doing is that he is setting up a different view.

🔊[21:01]

And setting it up as a constitution and the problem of the brain.

He wasn't in fact very influential.

I think he was rediscovered in the 1970s when psychiatrist who were taking very biological view of children's problems wanted to legitimize it and go back to sort of great original foundation.

And I think I know that because nearly all the references that I could find to the other people citing him in the 1970s through he was writing in 1900s and because most of them misspelled the lecture.

And the first person to describe it refers to Goulstonian Lectures as Goulstonian Lectures.

And everyone did the same.

So I think its illustration of how historians and professions were seeking after kind of validation of extreme biological view and he described children with poor attention, poor control and the emphasis was on constitutional deficit.

They are little inhibitory volition.

The ideas grew through the 20<sup>th</sup> century, still himself I think it was [\*Dalton influential close to neuroscience\*].

And much more in influential ideas in the ideas of brain disfunction of the line of thought that let through guy's hospital physicians into the formation of the hyperkinetic disorder which was the term in the international classification.

And through American's discovery of medication, leading to an emphasis on attention and learning, and the idea of reproductive casualty of children damaged at birth.

So physical idea leading up to the American ideas of ADHD.

Those ideas they are now being revised in the classification system.

So, as well as those ideas, another trend, in early modern child psychiatry is children increasingly being seen making their own development.

So the discoveries such young children or babies, come into the world recognizing their mother's voice [\*they are not tad bit louder\*].

They choose to look at the most important things in their world.

Where they look is determined by their experience in the womb.

They initiate both the interaction with their parents even the first days of life.

And that children are active agents really right from the start.

"The rise of analytically oriented teams" is very important.

They cannot describe autism.

And psychopharmacology came in the 1930s into the repertoire.

A child discovery, Ritalin in the 1970s which was on the market for the depression.

But as the market for that dwindled then they brought in as a treatment for what they then called minimal brain disfunction.

🔊[24:02]

And it did grow and grow.

By 1970s, the time there's saying there is defective for the hyperactive problem child and it's gone on rising.

And this is the worldwide figures all from the world health organization about the world production of Ritalin and related drug amphetamine rising steadily.

Most rising in America.

This is, again from the world health organization, the way the figures come in America and in Canada, well way down to the list so is Germany, Australia, Japan and France would be off the scale, nothing at all.

So huge differences, huge differences.

The benefits to the medication, this is Jason, "Ritlen makes me a hapyer persen."

Has not helped the spelling.

But this is just from the ability of the medication was the behaviors themselves rather than impairment in the child's actual life of the problems [\*so there's lots of...\*] just so child have problems, quite irrespective of them having problems all their symptoms themselves being the grounds for it.

Ask it if concern.

So, you know this is the notion that is just too commercial and easy.

It is like taking Ritalin-o's is just like taking cereal.

This is alternative to good bringing up or chances the child that is produced by medication is unnatural.

It's not a treatment but it's a restriction.

There is Calvin.

He is usually in trouble but in this particular film.

"Your assignment isn't due until Thursday."

"The pills are starting to work."

"I thought we could go outside."

"Sorry, I wasn't listening. I really have to finish this".

So there is sort of undue adultification.

But opposing pathology has been created.

For our whole notion of educating just say no to drugs but did you take the Ritalin today?

Yes! And there's something wrong with the whole notion of what happens in school.

This is another photograph from this museum's collection.

This is Christina and her room is swamped, I don't know if you can see it from the back expression on her face is rather triumphed.

So, she may not be disorganized at all, maybe the different organization she is intending it this way.

But the coming pharmacology helped to create the idea of what the condition was because in 1937, when it was introduced lot of people noticed for this school performance was better, the children was subdued, and they were more relaxed and no mentioned of hyperactivity or ADHD or attention ().

## [27:11]

The discovery was by chance, because at that time, all children coming to mental health would have lumbar puncture taken, to take a specimen from the fluid, the base of the brain of the spinal cord, because at that time there was epidemic of encephalitis and so lots of children presenting with problems were in fact presenting with the form of encephalitic disorder.

So they are all having lumbar punctures, so they all got headaches, and because they got headaches, Bradley thought that he'd introduce the new drug benzedrine and amphetamine to force up the blood pressure and force fluid out of the blood into the space around the brain to cushion the brain.

A dafted idea, but what he did notice from that was the performance was better, children was subdued, and relaxed and he went on to do the formal trial and showed the value of the medication and remained in the repertoire ever since.

But the outcomes in trials changed.

Initially reading better, intellectual gain, and became more relaxed and more sociable, and less aggressive.

And it started to be in 60s, hyperkinesis that was improving and by 1963, when Leon Eisenberg was starting to really first very good trials, good quality trials, then it was overactivity, learning, disobedience with the improvements.

So the development of the technology, lead to the development of the idea of what the disorder was.

And not to the drug companies, they weren't funding this research.

Then there are important other lines that were coming in at the same time.

This is John Valbe, who were at child care in the growth of love and what he's emphasizing is about how early relationships and the early touchable relationship in particular.

When they go wrong, that the child is left with an emotional, black, and they're left in series of trouble.

And other kinds of science is coming in as well, so this is Leo Kanner himself, who describe autism [\*there's judy's report\*] developing biological psychiatry, in Washington in America, this is [\*Micahel Rita\*] developing social child psychiatry and epidemiology at the institute of psychiatry.

And developmental research came in to work out longitudinally what the risks are in childhood, biological research has come in to measure the genes in the chemistry.

And the brain scanners arrived just a few years ago, in which really for the first time in the last five or 10 years, it's been possible to look inside of the brains of children, and see what's happening in disorder.

Because before that a lot of their methods of investigating adult's mental health problems, involved x-rays or positron emission, tomography, so they were quite invasive and they had hazard and they weren't very suitable for children.

🔊[30:07]

But the coming of methods that let us investigate the brains of children had a big impact.

And I will just show you briefly, so the results we've learned about the brain in this disorder of attention deficit hyperactivity.

This pictures are the side view of the brain in magnetic resonance imaging (MRI), this is the top view looking down, this is the front view looking head-on and magnetic resonance imaging is not invasive, it's passing the radio waves through the brain.

It's modulating them with the strong magnetic field, the same kind effect, as if in the car radio is going on the unshielded power lines [\*and there's correcting in the\*] interference.

But the nature of that interference is determined by the local magnetism within the brain.

So each molecule of water with hydrogen-oxygen bond is itself a tiny magnet.

So, you can visualize the fluctuations in magnetic field over the brain.

And as result this is the picture of distribution of water in the brain.

So you see the denser gray matter of the nerve cells and the whiter matter of the insulation, the myelin, of the brain.

And what I painted onto it of the areas which in 14 different studies of ADHD comparing teenagers and young adult with ADHD with controls.

There is an area which is in difference in size.

And the differences come in especially, and the color just shows the size of the effect.

And the color in the frontal lobes is illustrating a moderate size of effect, in somewhat smaller especially the right frontal lobe being somewhat smaller in ADHD than in controls.

This is base of Ganglia, this is where frontal lobe protect down to in organizing systems of the brain.

And this is the mid line of the cerebellum and I don't think any of us know exactly what the cerebellum is doing, but it's got more neurons in it than the rest of the brain.

So, it's sort of doing something important.

And this is the area that tend to be smaller.


It's not a diagnostics for the individual, it's a group effect and there's lot of overlap.

So we can't say from the scan, whether a person has ADHD.

But we can say that as the group, people with ADHD, have brain that are somewhat different in their structure.

Just put it dogmatically the frontal lobes protect on to the basal ganglia deepens into the brain, kind of loop that are used to inhibit behavior.

And this is a scanned of the brain.

 [33:01]

This is a front of the brain.

This the right side and that's the left side in a oblique view.

And there is the activation of the brain that comes in function imaging which is where blood with oxygen is arriving in the part of the brain that is being active.

So you can imagine the hemoglobin with iron in it, fix to the oxygen, it's a quite strong magnet since creating a strong magnetic signal about the parts of the brain which blood vessels opening up and delivering oxygen.

So what we don't know thing about what the physiology of this is.

It's call bold activation.

And it's the, it's been a powerful tool to think back in what's happening in different areas.

You can do it while a child is doing something; this is a kind of tests, in which children have great difficulty if they have ADHD.

What they're doing is if it's coming, if the area says left, you press the button on the left.

If the area says right, you press on the right.

But occasionally, you have a signal coming in which says 'don't press after all', [\*so the first attempt was\*] don't press after all so you've got to start then you've got to control and stop.

And the impulsive you started to make.

So it's exactly this idea of controlling, of controlling an impulsive through volition.

And we showed originally, the what we were getting was some under activation on frontal areas on either side, under activation on front areas and on striatal areas deepens the brain.

So it turned out that these with the same areas that were in small in size, what areas that will also activating working less hard in the people with ADHD.

And this was even for children who never had medication at all.

And it was even when they were getting it right.

So even if they were getting it right, there was still less response in the brain of the people with ADHD.

And each of these pictures is different study so each of these of the [\*social\*] extent to which are independent investigators have replicated that original finding.

It is pretty clear.

I think there is not much argument now.

But there is, indeed, under activation of important areas that are involved in normal people in inhabiting.

Indeed, it can go further, but we can tie the size and the activation of those areas into the presence of individual genetic changes.

This is one form of a gene and I'll come onto the genes in a moment, This is one form of gene, and the difference between people who've got the more pathological form of the gene and they are lesser and being lesser activated, are those with the full ordinary version of the gene is pretty striking.

🔊[36:00]

So there's genetic control of what's happening in the brain of people.

And other genes can be effected as well and they call it nucleus.

That's one change that we see in ADHD which is the brain is not working as



effectively, to inhabit when it should be inhabiting.

There is different kind of change, this is a response to reward.

In this kinds of test, what the children has to do is that they have to press, the series of letters come up on the screen, either X or O, you have to press the button.

In one condition you just know whether you've got it right or not.

And the other condition, you'll know and you'll win a penny every time you get it right.

So it's rewarded as system.

So revisualizing the difference between those, and the difference that the reward makes.

What we found then was really quite a specific change.

Because the people with ADHD, we compare both of controlled children, but also with people who don't have ADHD but do have what they call Conduct disorder which means the oppositional kind of problem like the first boy I was showing in the picture of the three boys who are anti-social, who are aggressive, but who don't have the disorganization that goes with ADHD.

Then what we find is the specificities in it, because these frontal areas are indeed reduced activation in ADHD compared even with children who have other forms of behavioral problem.

But looking at the fact the reward there is a different story because then it's the children with conduct disorder who are the one activating less so it's like the one root into problems which is the ADHD root to disorganization and failure to inhabit problems.

There is another root which is more reward-based line of the more oppositional children.

Should in fact in striatal little than more different sets of things in the brain more the areas that are controlling the emotions in the brain involved with perhaps more emotional kind of behavioral problems.


So we do find some specificity in the kind of brain changes we find.

What implication for this, well, I think the right implication, for instance, in the experience of having ADHD and what children say about it, they say that my thoughts are in the muddle, actually adults say this, adults with ADHD say they have rather unpleasant experience of their thoughts disappearing before they are finished, not following their trail of thought and one thought interfering with another thought like inhibition.

It's not working very well.

And children will say it if they respond well to medication, at that point they'll say that the treatment is showing the difference.

They often say "I get into trouble a lot, I don't know why," "Other kids pick on me," "I've got a bad temper," "I can't concentrate," "I've got ADHD," so the experience of ADHD is not great.

 [39:06]

They get into trouble not because of the wickedness of the original ideas that I was showing, but because inherent failure in doing it.

And the kind of problems that I invite you to do it now in one of the tests that we used to show children the kind of problem they have.

I'm now going to show you six pictures that will rather like this one.

I want you to say and please shout it out.

Which of the picture is most like this one, okay? Difficult? Well the points that I gave you in the amount of time that the child with ADHD used to solve the problem.

That 'Three' was very quick for reply.

That's very good.

Most people take about ten seconds.

Some bright people will get it very quickly.

But this test you can't really do it quickly because you have to check each one.

So trying to bring home to young people with the problem.

What they have to learn in life is to stop and think and analyze the problems in detail and not do the natural thing for ADHD which is to respond quickly, indeed.

The ability to delay of gratification comes with this, because this is the one called 'Cookie delay test', where you have one little piece of biscuit or sweets on the plate and you can take it right away.

But if you wait one minute without taking it, then you can have the whole plate that I've got behind me.

And this is quite difficult for kids with ADHD especially the young ones.

So again, it's the structures involved in reward.

Now only take a moment to tell you about the genetic background to this because I'm happy to answer more questions about it but it isn't involved, it's working progress and it's less securely established than the other bits of science that I've been telling you about this problem.

We know from comparing identical twins of all the same genes with no identical twins where they have half the genes we know that the similarity between the identical twins, somewhat greater in that between the no identical in that we reckon that something like 75-80% of the chain of the variation of the population is due to the genes.

As you look at the problems right about 75% are almost inheritable and Autism is right up to the top, stimulant abuses are much lower down but most psychiatric problems got quite genetic contribution.

When we look into individual genes, there's whole list of genes associated which, two of them in the dopamine system particularly well associated, these are genes that are involved in making the nerve cells responsive to the release of dopamine or which are altering the way dopamine is removed from outside the cells.

## [42:18]

The effect of dopamine systems in the brain, dopamine is a chemical which knows areas that I've been showing you about are particularly rich and there is genetic kind of distribution because the seven repeat variation which is one little bit of gene that repeats seven times and there's usual repeats of only four times.

The usual four variant is still the commonest in Africa where the human race evolved, and as humans are spread out to the rest of the world, the farther they've gone from Africa, higher the concentration of this seven repeat which is the one that is particularly associated with being attentive and restless.

So you can just [\*](42:59) America, you get even, it becomes the commonest version.

This isn't ADHD, this is one gene associated in ADHD.

It's got a small effect.

So it's not gene for ADHD but it does suggest that it's one of the things underline ADHD may have purpose on the functional significance.

And it may, perhaps, help in coping with very new environment.

Or maybe you can throw out to the tribes so you have to migrate or maybe a good thing for the group to have few people with ADHD in it.

Just the last few weeks, it has been a great triumph in which the method of working through the particular spots on the chromosome, genome scanning.

You credit the cryptic of the chromosome to millions of tiny pieces, you find which one is associated with ADHD.

And then you find in the spot that is associated, you find, you look up genome scan which genes are in that spot.

That looks as if we have identified the gene that called Cadherins which play fundamental role in the normal brain cell development.

But What's inherited? It's not ADHD, it's a continuum.

And the influences vary with the context and you inherit dispositions to react.

So what the gene gives you, it's the likelihood of responding to one way to, one environment, in a different way to another environment.

So, the gene, it's not whole genetics or whole environmental on.

In fact, it means four genes determines for instance, whether a child was exposed to alcohol in the womb, because mother is drinking, and that child will develop a hyperactive syndrome or not.

The both the seed and the soil.

But, I return to my original thesis, antitheses, if ADHD is so neurological, how come it varies so much in different places? How come it's hundred times common in America than in France? Isn't it really a social disorder? And what about the rise of television and the decline of the family? The other things that we think, impairing, some aspects of children's ordinary learning regulation and self control.

🔊[45:03]

And it seems to go like this.

This was the way it was in 1980 and in the late 70's, 30 ages, when it was diagnosed in about one child in two thousands in this country.

And this was way it was by the end of the 90's, what is being diagnosed in about three or four per thousand.

Big increase.

Dwarfed by what's happened in America, dwarf it now, so there's red tickers.

So the what I just showed you in America, this is what it shows in America where it was what percentage of children is now what is more is like 5 percent of children who are now being diagnosed and treated with ADHD in America.

Kind of worry.

But if now I show you what this true rate of disorder, not diagnosed, not what happens in clinics, it diminishes the preference, but the real preference from epidemiological studies when you go around counting heads, then this hyperkinetic disorder which is unchanged over the time from the surveys that we did over 20 year periods.

This is a rate of the ADHD.

The hyperkinetic disorder is a severe form of ADHD this is when we diagnosed in the U.K.

So the differences are actually, in recognition, and not in level of disorder so the disorder is rising, the epidemic - the epidemic of concern - and rather similarly, for the differences across countries.

Because this is the rate in the UK in red and in green, in the study that we did in Hong Kong, the Chinese population that was using the same methods we've done in study in London.

In Chinese population, according to parents and teacher ratings, they were very much more prone for children to be more hyperactive and inattentive.

But of course, for those of you who have seen Chinese children, opposite of china then of course in a sense of absurd because the children are very well controlled.

And when we actually extended that to use detailed measures, of the way the children were actually behaving, then actually it was a different story entirely.

The rates are lower and the rates become less in the Hong Kong population than in the British.

So the difference between the two was not in a way that children behaved, but in the way the society reacted to it.

And in Hong Kong society, you absolutely have to achieve in school.

No exams, no job.

No job, no offer.

Depended on your family.

Much more than in this country, well at least in working class culture, how well you

do well in school isn't a very strong determinant about whether you are successful in life or not.

So that is an epidemic, but it's an epidemic of concern.

The shared environment, the different children and family share, doesn't play very much part at all.

So it's not television watching, and it's not parental incompetence, that's getting rise to it.

🔊[48:05]

There are only small differences in societies, little increase over time, but there are big cultural differences in what is recognized.

I think of it this way, the complex disorder is much be caused the genes interact with the environment and they produce a disposition the child to be restless, inattentive and uncontrolled.

The effects of that in life can be very varied.

It can produce an environment that's putting negative.

They get in trouble in school, other children protect them, they get more physically punished than other children.

And that in turn, is giving rise to distress an aggressive behavior in the children.

So the cause of children going astray and getting into trouble with delinquents of the law.

But it's a mediated cause by the reactions of other people.

Now that reactions itself, is mediated by the other genes.

Cause there's another gene in the moderated [\*] system which will predict whether a child has been exposed to harsh punishment for themselves become violent.

So then the cause, is a mediated cause, where they get another gene environmental interaction coming in.

Now, I think I know this because first of all, it's not just genetic because studies from my colleagues doing longitudinal twin studies at the time, says even identical twins then it's the reaction of the people that's predicting the response of the kids.

I know it's not just bad parenting because I know two from trials, when the child is medicated and the hyperactivity reduces, then all the negative reactions also reduces.

So the child does help to drive the way the parents react.

It's not the whole story, because there are direct continuity as well.

And I know that because we take adults with ADHD and there's some children from epidemiological survey about 20 years back, where we followed them twenty years on and quite a few of them still have ADHD.

And we put them on the scanner, and we find the exactly same problems under-activation of key areas that I was talking about with children.

So the direct continuity and the marvelous studies in America from Brookhaven national laboratory, has been using positron emission tomography, a radioactivity, directly to measure the level of dopamine in the brain and find that adults, never been treated, have low levels of dopamine in striatum.

So, the child is at risk.

But we need to think about how to create more friendly environment with the child with ADHD.

This is why I'm saying the answer is "Yes" to a neurobiological social, it is both very important.

You have to think both of the immediate context of how parents are bringing the children up which I think national academy of parenting practitioners set up to try to achieve, and also about how that is determined about social influences that is effecting the children and about social measures that is needed to do it.

## [51:07]

Somebody in schools, we need to think about how to make schools more friendly to ADHD children.

We know lots of things that are important and the child suggests important, actually put it them into practice.

So making ADHD friendly environment is one of the targets that we have to do as well as, not instead of, helping children that who do have disability from the problem to reduce the problem itself.

The view that you will look forward to in the future is bit mixed.

One view is in impulsiveness as a failure.

And this is the charge of the light brigade, dreadful story, Captain Nolan is obviously the man of ADHD, pretty reckless, great personal bravery sets at the light brigade and charge down that valley punch to the wrong valley, lack of attention to detail,

very ADHD.

The commander in charge says "we can't charge down that valley, the Russian guns are there" Nolan says, "go on, go on, that's the valley, do it anyway" A lack of correction of detail which played the key part and [\*] charges that wiped down to seeds and it's a bit of disaster.

Sometimes it's a mix.

This is Paul Gascoigne whose impulsiveness on the field is a magnitude of Genius.

His ability to react to fractions of seconds to complex situations, but he's personal life has been a disaster partly because of that same impulsiveness.

This is more positive view that I want to finish with, which is impulsiveness can also be a strength to the people who learn to cope with it can do very well.

And this is a young man who was [\*] of adventurer, and [\*] from impulsiveness, became a war correspondent but actually join the army but he wasn't a soldier fighting with them and he becomes friend with Churchill, well he is with Churchill.

So he does find it very important in each for the use of adventurer and impulsive style.

So there are positive things as well.

So this really is my conclusion, which I want to finish.

About complex trait in people with strong biological determinants whether it becomes impairing or not depends very much upon the reaction of people to that.

I think of examples things that we have to recognize genuinely thinking about mental disorders that those with strong genetic influences they are not deterministic and lot of people make of that constitutional in their lives remains an important area in an operation of free will and help.

Thank you