

Institute of Education



UCL

Can the language of 11 year olds predict their future?

Alissa Goodman, UCL Festival of Culture 6th June 2018

CENTRE FOR
LONGITUDINAL
STUDIES



“Imagine you are now 25 years old. Write about the life you are leading, your interests, your home life and your work at the age of 25”

7. Imagine that you are **now** 25 years old. Write about the life you are leading, your interests, your home life and your work at the age of 25. (You have 30 minutes to do this).

I am sitting in a ward on night duty I will soon
 be a ~~Staff~~^{Sister} nurse, I think I enjoy the work
 in hospital, although the work is hard. I am
 married, my husband is a prisoner I have
 one child but will be leaving hospital soon
 to have another. We live in London because
 the hospital is there (Guys hospital) but are
 hoping to move soon further north. We
 live on the outskirts of London in a
 modern semi detached. I enjoy reading
 and playing with animals we have a
 cat and dog. My life at home is very
 leisurely. About the world we now have

Do not
write
here.

Col. 51

0

Col. 52

2

Col. 53

Col. 54

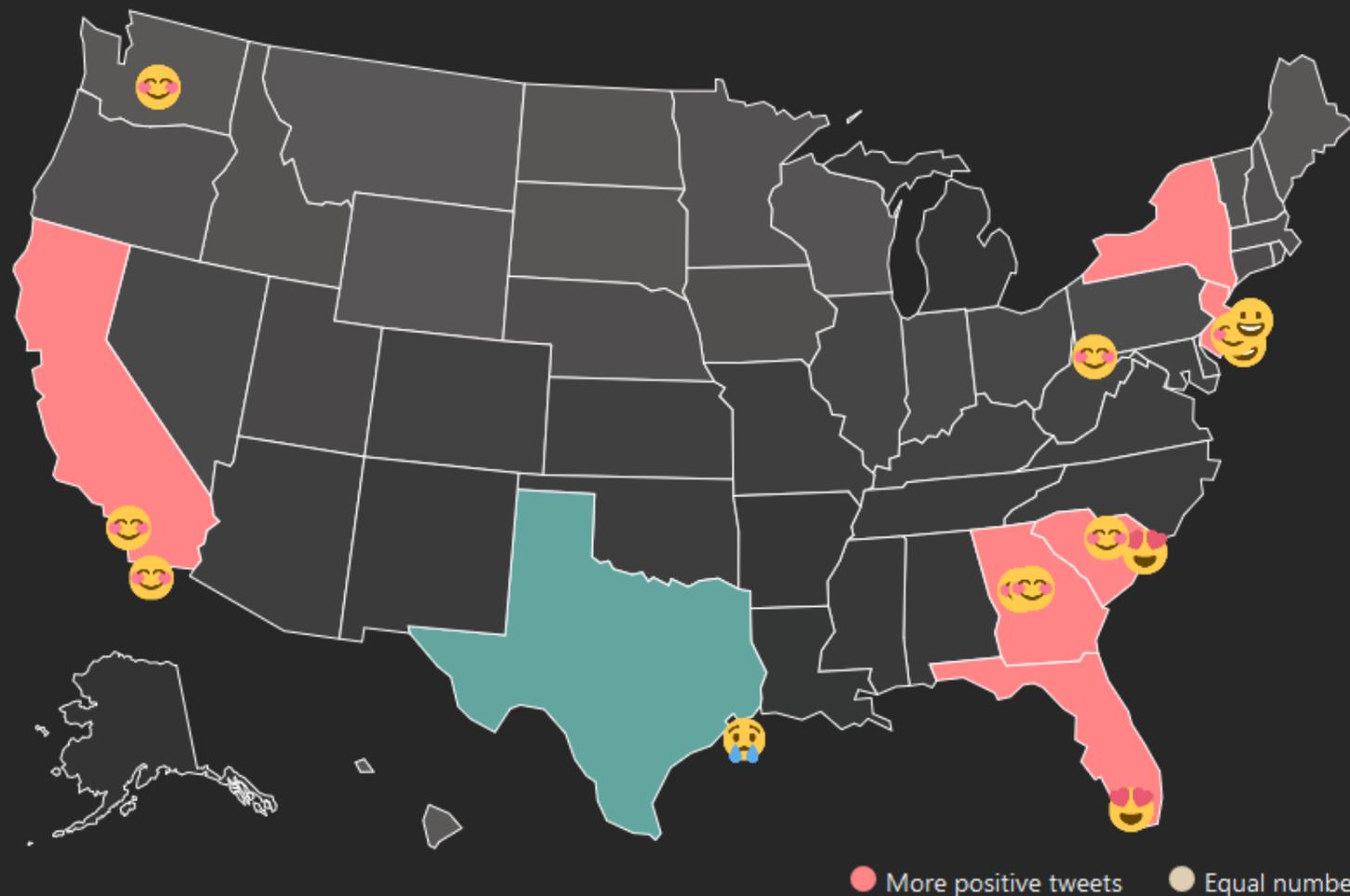
Col. 55

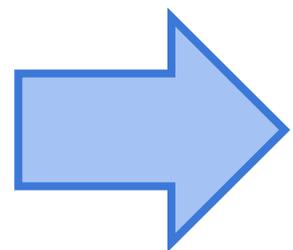
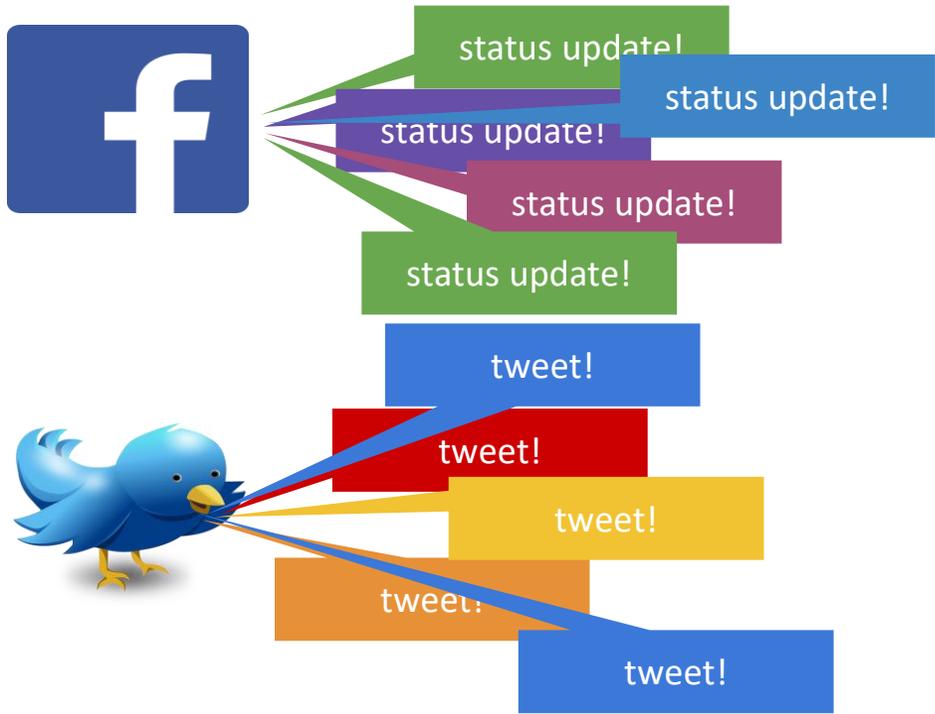
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how is america feeling right now?

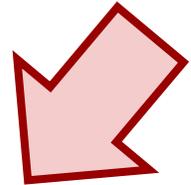
This map shows the emotional "state" of each state at any given moment. Positive or negative sentiments are loosely determined based on an analysis of key words used in tweets. The realtime data comes from the [@PubNub](#) Data Stream Network and PubNub's out-of-the-box access to the live Twitter stream.

Fork me on GitHub





**language
analysis**



Outcomes

A red-bordered box containing four icons: a human figure with a heart and ECG line, a profile of a human head with a brain map, a document with a checklist and a red pen, and a pink female symbol and a blue male symbol.



May 24, 2014

TIME

NICOLE
DOES THE
CAVYAN



BELIEVE IT
OR NOT, THIS
91-YEAR-OLD
NUN CAN HELP
YOU BEAT

ALZHEIMER'S

A landmark study of the
disease sheds new light on:

- WHAT CAUSES IT
- HOW TO PREVENT IT



DO CHILDHOOD DREAMS COUNT?

In 1969, thousands of children were asked by scientists to predict their futures. Fifty years on, what did life deal them?

IN 1969, Margaret Thatcher became Shadow Education Secretary, Neil Armstrong walked on the moon and 10,000 11-year-olds — all born in a single week in 1958 — wrote essays predicting their lives at 25.

Either about to leave primary school, or newly arrived at secondaries — they described their hopes and ambitions. All were part of the National Child Development Study, which has kept track of their lives every decade for 60 years.

This year, those baby boomers turned 60 and, here, five of them talk to BETH HALE about how their childhood dreams have matched up to half a century of reality.

I still regret money woes killed off my ideal career

JACKIE ADKINS laughs as she re-reads the three paragraphs that constituted her idea of an 'essay'.



"I work in a hair dressers and looking for a shop (sic) when I have saved up some money I will buy one" she wrote. Cinema trips with friends and buying clothes on a Saturday — those were Jackie's dreams. Today, she has been married to Paul, 83, for 35 years and has three children and one grandson. She wonders whether she wrote so little because she was so certain where she would be at 25.

"I was always going to be a hairdresser," says Jackie. "I used to cut my own hair and my mum's and I used to carry my hairdressing scissors in my school bag and at lunchtime the girls would say 'can you do my fringe for me?' or 'can you put layers in my hair?'"

Duty: For Jackie Adkins, her family came first

I wanted to be a nurse — then realised girls CAN be doctors

AS A girl growing up at a time when men and women had strictly defined roles, hospital-obsessed Sally Seth-Smith assumed she would become a nurse.

"I am sitting in a ward on night duty I will soon be a staff nurse," reads her painstakingly neat essay — neat except for the fact that staff nurse has been scored through with a single line and replaced with 'sister'.

It was only later, while at her small comprehensive school in Cumbria, Sally realised she might be able to become a doctor.

"My mum was a nurse and my dad was a doctor, so I was always very interested in medical stuff. I used to have a permanent hospital for my dolls and teddies set up in my bedroom, where I would do ward rounds, check their temperature and stuff like that."

"As long as I could remember, I had wanted to be a nurse and then someone said to me 'You might be clever enough to become a doctor,' and I thought 'Gosh, can girls be doctors?'"

"Men were doctors and women were nurses, and that was absolutely how it felt then."

But a seed had been planted and Sally, who settled in Hampshire, has now been a GP for 30 years. Two of her children are also doctors, and her youngest son works in finance. She has two



Nursing ambition: Sally Seth-Smith is now a GP



LOOKING back, Steve Christmas is all too aware of the poignancy of his essay.

Writing about his grown-up life, he predicted he would be a 'surgant' (sic) in the Police with a wife named Jane, a new surname (Stephenson), a house in Wales and four children.

The new surname and life in Wales were, he suspects, because he wanted to get as far away as possible from Harwich, Essex, where his parents ran a café and sweet shop. Steve's father was an alcoholic who could put away a bottle of whisky a day and was verbally abusive to his wife and two sons.



All I knew was that I didn't want to be like my father

uprooted them all again to nearby Hastings. "I remember making a conscious decision that I wasn't going to be like my father," he says.

Steve didn't become a policeman — he realised before leaving school that at 5ft 9in he wasn't tall enough and that he would struggle to pass the exams he needed.

Instead, several years later, he started working for an insurance company, and studied at night to pass his vocational exams, discovering he was actually quite bright after all.

Fatherhood came late for Steve. After leaving home at 31 to marry Sue, they eventually had daughter Emma, now 23, through IVF, thanks to Professor Robert Winston.

"All I wanted when I was 11 was structure, to be happy,

have children and for them to be happy, and that's what has happened," smiles Steve, who took early retirement before setting up his own business writing wills.

"That last year I learned a lot about him," says Steve. "I stopped him drinking so much, stopped him smoking. Before he died he gave me a big cuddle, which he had never done, he apologised and said: 'I'm really sorry for what I've done.' Life's too short to stay bitter. What happens in your childhood doesn't have to hold you back."

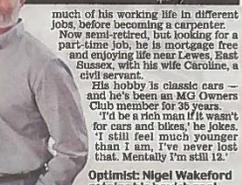
Reconciliation: Steve Christmas found domestic happiness

My dream was dashed but I still feel like that little boy

NIGEL WAKEFORD was a clever child who passed his 11-plus and became the first boy in his family to go to grammar school. He was a happy childhood with his three siblings and parents. "My dad married at 18 and was working class. He did lots of different things, and ended up doing admin for a bus company," recalls Nigel. "But if he had ten bob in his pocket he'd take us out on the weekend." There were sailing trips, horseriding and countryside jaunts.

At 11, Nigel dreamed of being a soldier. Visualising life at 25 he wrote: "I do not spend much time at home because I travel a lot abroad. At the moment I have a job as corporal (sic) in the army. There is a lot of drill and hard work in it but we do have some pleasure time we go to the pictures and have dances."

Sally, Nigel's dreams of joining the Armed Forces were not to be. Leaving school at 16, he did attempt to join the RAF. I went to the recruitment office in Brighton and did all the exams. I was told I had one of the best English comprehension test papers they'd ever had, but then I went for the medical and failed because I don't sit reading a minor eye defect, a 'lazy' eye. Naturally optimistic, he is not regretful but feels he missed out on a 'career'. While clever enough to get his English and Maths O-levels a year early, he spent



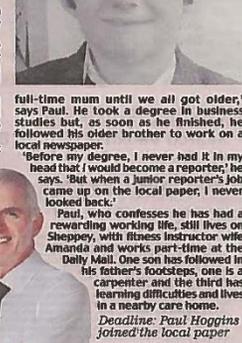
Optimist: Nigel Wakeford retains his boyish zeal

I was bored with the workday grind even then!

AGED 11, Paul Hoggins imagined life as a lawyer who has already fallen out of love with his job.

He wrote: "The alarm clock goes for the start of another day. Another day of work at the office. How boring all I do is sit reading books... Why couldn't I be a miner instead of a lawyer (sic) (who doesn't do a thing)." The event has become a journal, and while he doesn't remember his childhood ambitions, he recognises his love of language and sarcastic outlook in the essay.

My wife saw it and laughed and said that explains a lot," says Paul, a father-of-three who has four grandchildren. "For an 11-year-old, there's quite a dose of cynicism in there. And I always enjoyed creative writing and English."



full-time mum until we all got older," says Paul. He took a degree in business studies but, as soon as he finished, he followed his older brother to work on a local newspaper.

"Before my degree, I never had it in my head that I would become a reporter," he says. "But when a junior reporter's job came up on the local paper, I never looked back."

Paul, who confesses he has had a rewarding working life, still lives on Sheppey, with fitness instructor wife Amanda and works part-time at the Daily Mail. One son has followed in his father's footsteps, one is a carpenter and the third has learning difficulties and lives in a nearby care home.

Deadline: Paul Hoggins joined the local paper

CENTRE FOR LONGITUDINAL STUDIES

At 11, these kids tried to predict their future. Did they get it right?

In 1969 10,000 children were asked to write essays predicting what lay ahead. Three of them, now 60, tell Damian Whitworth how those hopes and dreams matched reality

One girl predicted environmental disaster on Earth and colonies on the moon. Another wanted to be a nurse and go riding at weekends. One anxious little boy hoped his children would have the happy childhood he had been deprived of.

In 1969 more than 10,000 11-year-olds who had been born in the same week in 1958 sat down to write an essay on what they thought their lives would be like when they were 25. The children, who turned 60 last month, were part of the National Child Development Study (NCDS), which has become one of the world's most useful long-term examinations of how people live their lives. The essays were written at the request of researchers.

Since the initial birth survey of 17,000 babies there have been nine "sweeps" of the 1958 cohort to collect information on economic circumstances, educational and physical development, employment, family life, health behaviour, wellbeing, social participation and attitudes. This provides seams of data that are mined by institutions all over the world. In the latest sweep in 2013-14 5,000 people contributed.

The cohort, which turned out to be broadly upwardly mobile, is most famous for providing the data that showed that smoking during pregnancy cut babies' weight and increased the risk of infant death.

The group members provide their data to researchers anonymously through questionnaires, interviews and biomedical surveys. However, three contributors have agreed to discuss their essays and how their childhood hopes and dreams matched the reality of the subsequent half-century.

Sally Seth-Smith

Sally, whose essay is packed with imaginative predictions, turned 11 three days before a family tragedy that

"If I had had a nice early life I don't think I'd have done as well"



would change her life. The daughter of a doctor and a nurse, she imagined that at 25 she would be a nurse, married to a doctor, with one child and another on the way.

Men first walked on the moon that year, and Sally imagined that 14 years hence there would be a 2,000-strong colony of moon dwellers and Russia would no longer be a threat to other countries.

Ten years before Margaret Thatcher took office, she forecast that Britain would have ditched the monarchy in favour of joint rule by a man and woman who listened to citizens.

She recently read the essay again for the first time in almost 50 years. "I had mixed emotions. It was sad, poignant. I suppose because of what happened to me days afterwards."

Sally's mother had discovered that her husband (Sally's father) had been having an affair with one of her friends. Three days after Sally's birthday, and the day after one of her brothers' fifth birthday party, her mother disappeared. Sally worried that she was somehow responsible because a few days before she had refused to lay the table. "I thought, 'Oh, it's my fault because I wouldn't help.'"

A week later her mother's body was found in her car. She had taken an overdose. "Sadly, she had been planning it... for the day after my brother's birthday. She did his party and everything." Her father did not tell her or her three brothers that their mother had committed suicide, just that she'd died. "I was in shock for a long time. I didn't speak for at least a month," she says.

The family moved to Cumbria where her father joined a GP practice. "I am sure he was escaping his past." She had three stepmothers, the first of whom also made a suicide attempt. "I can remember being terrified she was going to kill herself, and when I was about 15 I used to wait at home. I thought she needed somebody to hang around."

The truth about how her mother



had died dawned on her only after she overheard a

remark at school and an aunt blurted something out. "For years I couldn't even say 'suicide'." She then asked her two elder brothers if they had known. "They did and, like me, found out accidentally and never said anything. It's a difficult thing to struggle with, your mother killing herself. Maybe it was better I didn't know until I could understand."

She never discussed the subject with her father. "You couldn't talk to him. He was difficult, grumpy. I think he felt really guilty. I think the four of us felt a bit responsible for him. It probably blighted his life."

Sally does not remember being unhappy and believes her father was unwavering in his love for his children. "We are all pretty stable, rounded humans who have made good relationships and become reasonable members of society."

Soon after she turned 11 someone told her she was clever enough to be a doctor. "I remember thinking, 'Girls aren't doctors, girls are nurses.'" Her father wanted her to have the same education as her brothers, but when she went to a boarding school in York for her sixth-form, her headmistress tried to deter her from studying medicine because it would be "very difficult" for a woman. "That outraged and motivated me. I wanted to be a doctor and I carried on until I was."

She studied at Guy's Hospital medical school in London, where she met her husband. They eventually settled in Hampshire, where she has been a GP for 30 years and is prominent in local medical politics. "The family moved to Cumbria when her father joined a GP practice. I am sure he was escaping his past." She had three stepmothers, the first of whom also made a suicide attempt. "I can remember being terrified she was going to kill herself, and when I was about 15 I used to wait at home. I thought she needed somebody to hang around."

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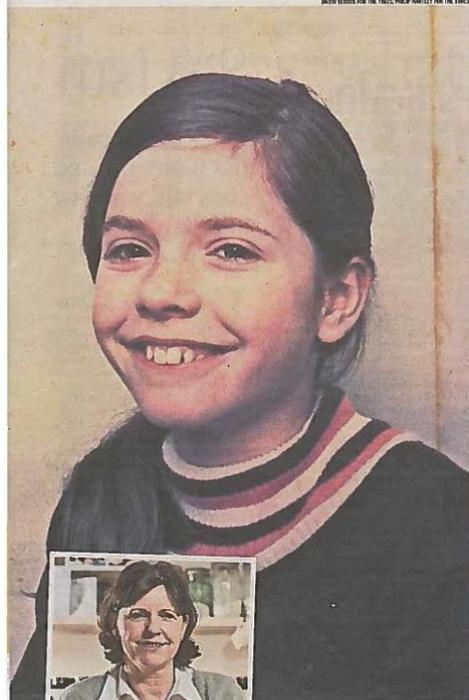
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Sally Seth-Smith. Above left: Claire Davis. Below left: Steve Christmas

structured and you're respected." He built a very successful career as an insurance salesman, then as an independent financial adviser, determined to create security for his wife, Sue, and their daughter, Emma.

He never went on holiday when he was young, but he has taken Emma on numerous long-haul trips. "I've given her all those things I never had." She is now a cabin crew member for an airline. Steve retired at 50 and runs a will-writing business. "If I had had a nice early life I don't think I'd have done as well. I learnt from my parents' mistakes. I could have gone the way of my dad, but I haven't. I have a glass of wine, but I can take it or leave it."

At the end of his life his father apologised. "He gave me a big cuddle, which he'd never done before, and said: 'I'm sorry I have treated you all so badly. I forgave him. Not everything runs smoothly in life.'"

Claire Davis

As a child Claire wanted to be a vet. In her 11-year-old essay, however, she said she wanted to be a hospital matron "or even higher". Her father was the managing director of a matings company. She wrote that he

was a doctor, so when Claire read the essay recently she thought they'd got the wrong girl. Then she saw beyond the little fictions. "I realised there were strong connections between what I had written and my family."

She had an idyllic childhood in the Suffolk countryside, climbing trees, rescuing injured hedgehogs and boating on the county's waterways. Her mother was a teacher and her father, later retrained as one. "My parents probably gave me ambitions to work with people and have a job where you could make a difference."

After earning a degree in ceramics at art school at Middlesex University London, she worked in management in social services in London, then for Royal Doulton. She and her husband, Ken, have been together since they were 16 and married for 37 years.

They returned to Suffolk to raise their children close to grandparents and cousins. "When their youngest child started school, Claire followed her parents and sister into teaching, specialising in art. "I thought that to use my degree within teaching would be a really good way to be happy and would fit in with my family life."

She never sought a job with a matron's level of responsibility. "A balance with family life was more important." She now spends her time painting. Her daughter is a diplomat, one son is a doctor and the other works in the NHS. More on the 1958 National Child Development Study at cls.ioe.ac.uk

CENTRE FOR LONGITUDINAL STUDIES



What can we learn from the language used by 11-year-olds about their future?

-  Social mobility
-  Cognition
-  Physical activity

National Child Development Study

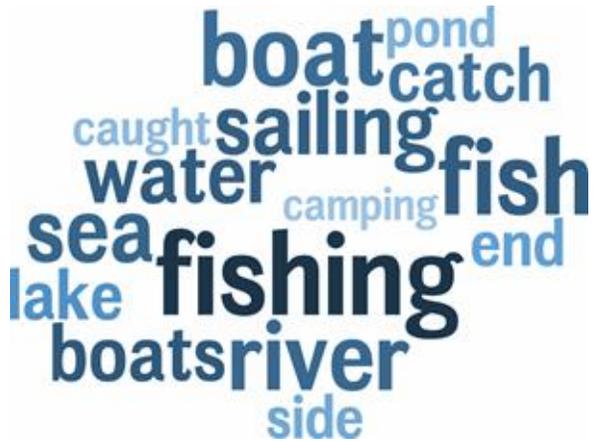
- Longitudinal birth cohort study of all babies born in a single week in GB
- Multidisciplinary content spanning social and biomedical



1958	1965	1969	1974	1981	1991	2000	2003	2004	2008	2013
Birth	7	11	16	23	33	42	44/45	46	50	55
17,415	15,425	15,337	14,654	12,537	11,469	11,419	9,377	9,534	9,790	9,137

Generating topics from essays

Topic= A group of highly related words and phrases.



“I am twenty five years old and I work in a sports shop. My hobbies are going fishing and I like sea fishing best . I go shooting pheasants and grouse as well and sometimes I play foot-ball. I live in a flat and I am going to buy an astin martin and a small boat and I go sea fishing every sunday. When I am sea fishing I will be spinning for mackrel and outherr fish.I will buy a sports shop”

Generating topics from essays

Each participant receives a probability score per topic:

Participant 1

topic 1: .05

topic 2: .02

topic 3: .01

...

topic 100: .07

Participant 2

topic 1: .03

topic 2: .01

topic 3: .03

...

topic 100: .05

Participant 3

topic 1: .04

topic 2: .03

topic 3: .03

...

topic 100: .06

Boys

team tennis football_club golf watch sports cricket football play matches playing club sport rugby play_football

mini test driving garage van red am_twenty_five morris number drive ford blue car capri

boat pond catch sailing water fishing sea lake boats river side

motor fix mending mechanic cars bike racing car moter garage fast mend petrol sports_car ride

fast rolls cars run driver drive won lorry races long track driving racing win

leave guns gun training tank joined men tanks army join shooting fight war

golf boys kids play_football wives wife likes son children oldest works aged county year_old sons

jobs making made building carpenter my_spare_time engineer make things radiomodels model build electric

force raf test aircraft plane airport flying planes fly pilot air aeroplanetraining flight jet

Girls

one_child
little_girl
works
looks_after
years_old
likes
husband
married
next_door
child
daughter
husbands
housework
my_husband_works
nursery

my_husband_works
send
husband
play
park
love
children
twins
nursery
look_after
older
childrens
names_are
looking_after
school

cook
sewing
clothes
interests
my_spare_time
watching
very_much
making
swimming
love
dancing
knitting
cooking
enjoy
reading

class
school
history
boys
teaching
primary
teacher
learn
junior
maths
teachers
english
girls
games
teach

give
husband
walk
sit
sleep
girl
look_after
pram
babies
sitter
babys
boy

hairdressers
hairdressing
dressers
girls
dressing
set
people
cut
hairdresser
peoples
hair_dresser
salon
lady
shop
hair

boy
boys
called
twins
two_boys
children
call
names
boy's
two_girls
twin
older
girl
girls
marry

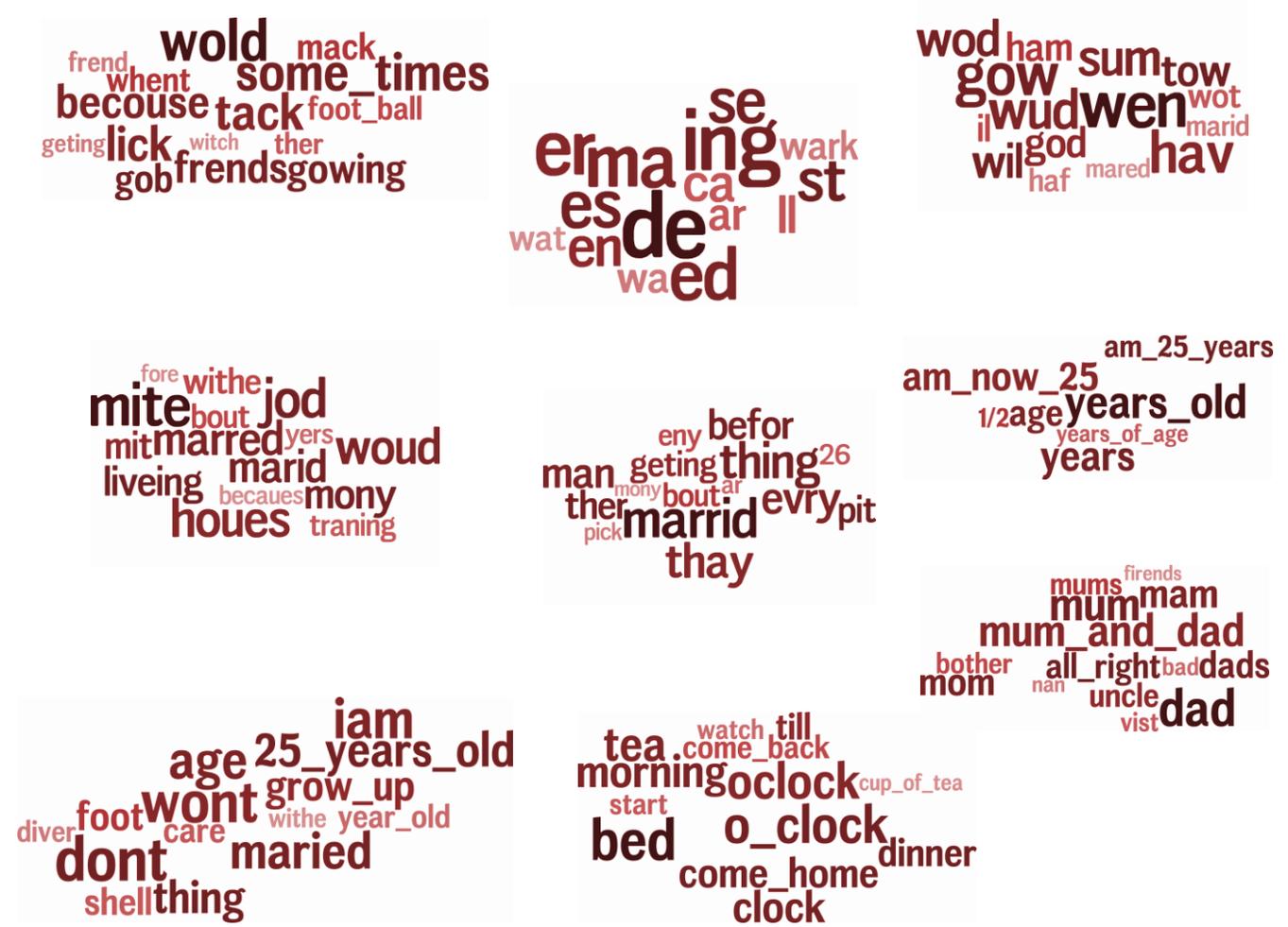
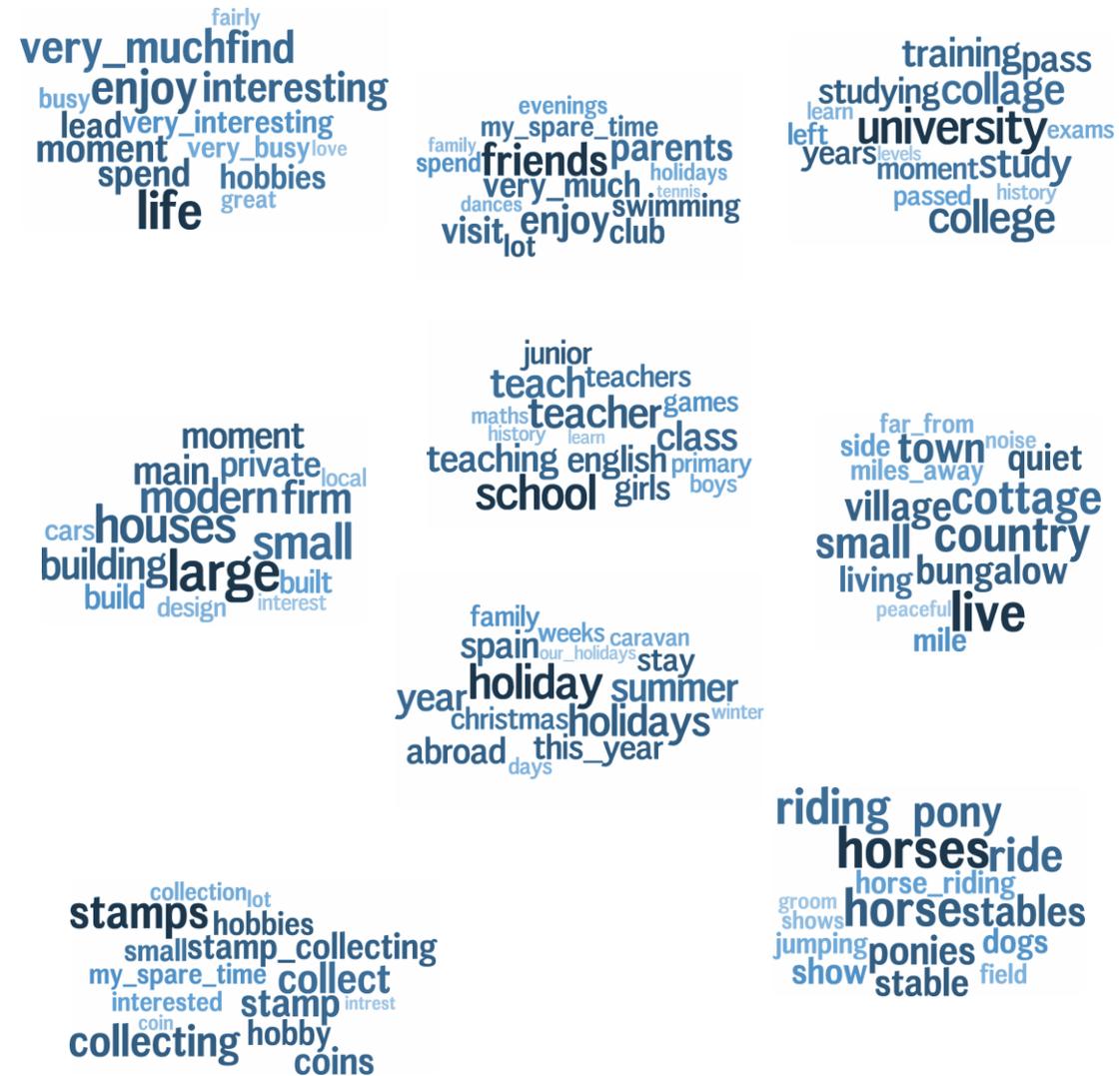
sister
nurse
doctors
nursing
ward
nurses
hospital
doctor
childrens
training
sick
ill
duty
patients

ready
bed
wash
breakfast
tea
early
finished
cook
supper
dinner
cup_of_tea
put
watch
make
washed

Topics by father's social class at age 11

Higher social class score

Lower social class score



“I have a good job as an engineer and live on the outskirts of the town. I own a large house and equipment for astronomy which is my favourite hobby. I have a camera, cine-camera, projector, flash-gun and other equipment for use in photography. I have two dogs.....”

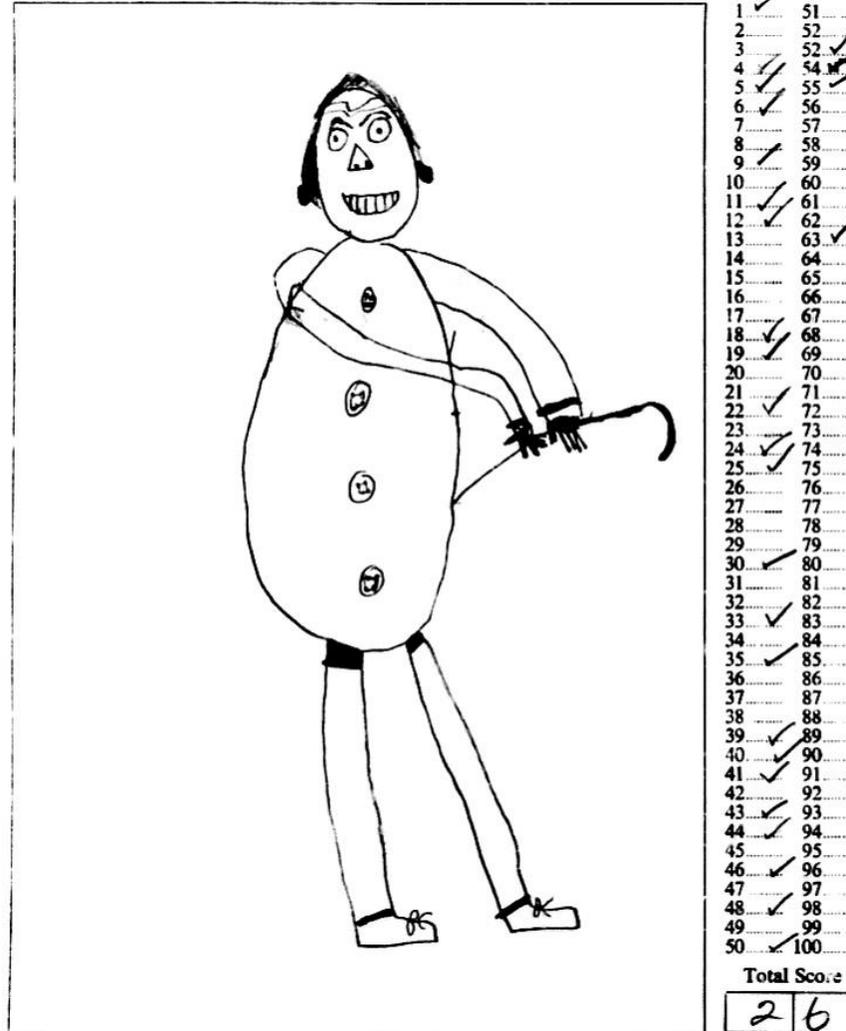
“I AM Now 25 years old My Job is bilder I go to Work At Seven o.clock in the morning and come home at five o.clock When I Get home in the Evening I have My dinner and the Watch T.V. and after I go to bed Then at Seven o.clock I go to Work A man comes for me at twelve o.clock I have Some thing to eat”



Topics predictive of higher future income (women, including survey controls)

<p>Higher income</p>				
<p>Lower income</p>				

Do essays predict cognitive function?



Cognition: complexity score

- How complex is the language in an essay
 - = Average number of characters per word
- Scores were generated as follows:
 - Extract all words in an essay
 - Count the number of characters for each word
 - Take the average
 - Correlates with general cognitive ability at age 11: $r = .29^{***}$

Example essay for high complexity

The chemical plant was now running under my supervision as the manager did last week. My work was to design a new atomic rocket motor. At home my main interest is electronics. Already I am manufacturing intercoms on a small scale. My house is a three bedroomed bungalow as I make intercoms the house is fully rigged with an intercom system and an elaborate exchange system.

Col. 11

0

Col. 11

3

Col. 11

Col. 11

Col. 11

Col. 11

Example essay for high complexity

I am leading a quiet life with my wife and my eighteen month old baby. Out side in the garden I have a fully equiped laboratory laboratory

Do not
write
here.

Example essay for high complexity

“The chemical plant was now running under my supervision as the manager died last week. My work was to design a new atomic rocket motor. At home my main interest is electronics. Already I am manufacturing intercoms on a small scale. My house is a three bedroomed bungalow. As I make intercoms the house is fully rigged with an intercom and an elaborate exchange system. @@ I am leading a quiet life with my wife and my eighteen month old baby. Outside in the garden I have a fully equipped laboratory”

More complex essays at 11 predict higher cognitive function at age 50

	Cognitive function at age 50	
	β	R ²
1. Basic model		
Essays complexity score	.03**	.00
2. Including cognitive tests score at 11		.05
Essays complexity score	.04***	
Cognitive tests general ability at 11	.23***	
3. Including set of covariates		.07
Essays complexity score	.03**	
Cognitive tests general ability at 11	.22***	

** statistically significant at 5% level

*** statistically significant at 1% level

Topics predicting age 50 cognitive function



Predicting age 50 cognitive function (all controls)

+

love busy enjoy
spend very interesting
lead life hobbies moment
very busy very much great
interesting find

small living friends rent
block lives boyfriend mine
share meet london cinema flats
friend flat

pass left study
studying training
levels moment university
collage exams
learn history years
college

private building
design large built
small modern firm
build cars moment
houses main
local interest

-

wot haf
ham gow tow
mared hav
sum wen god
wod il wud
marid wil

yers becaues fore
traning marred mit
jod woud
mony liveing
with marid mite
bout

ther frend lick
becouse some times
gob tack wold whent geting
foot ball frends mack
gowing witch

Do the essays predict physical activity?



Physical activity: the Spectator and the Active

- “[....] When I come home I just slump down in a chair and read a paper. When I have the chance I go to a football match [....]”
(Spectator: Male)
- “[....] my Job is a hair dresser. [....] I work from Eight o’clock in the morning to half past Eight at night. [....] When I go home at night I go swimming. for half an hour.[....]”
(Active: Female)

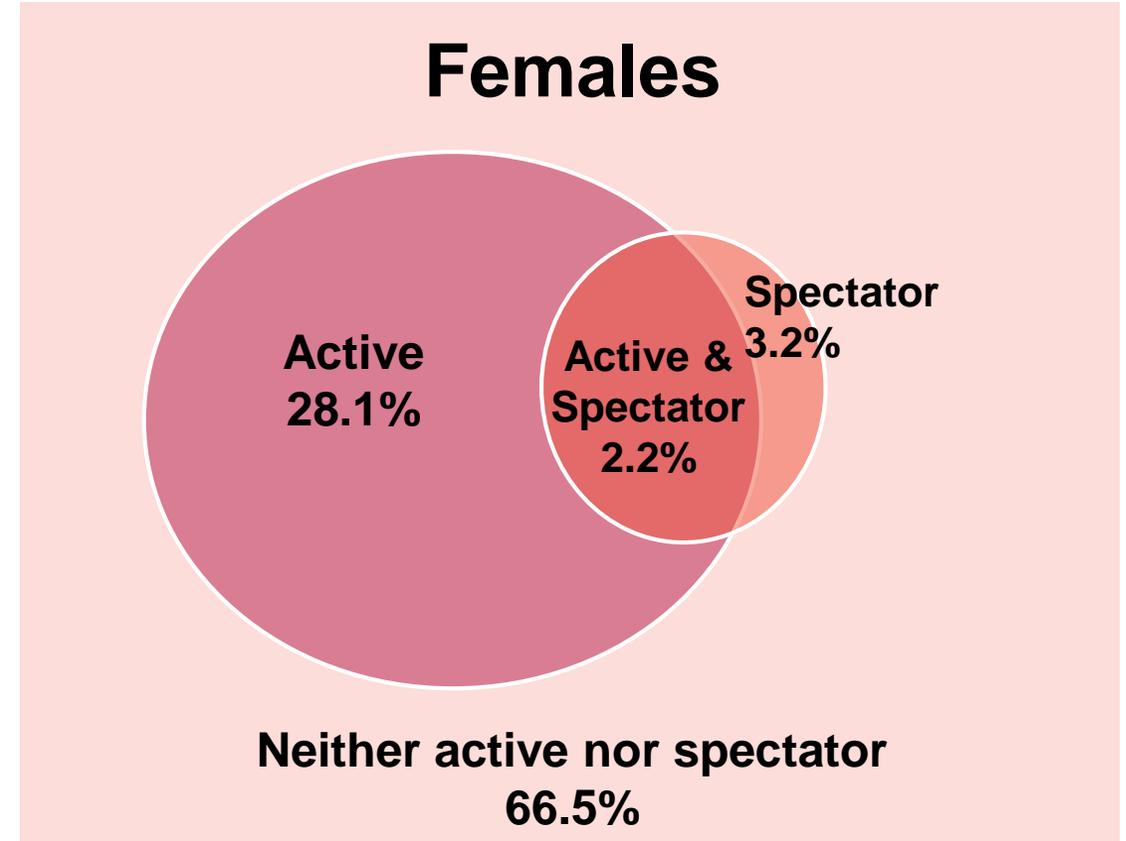
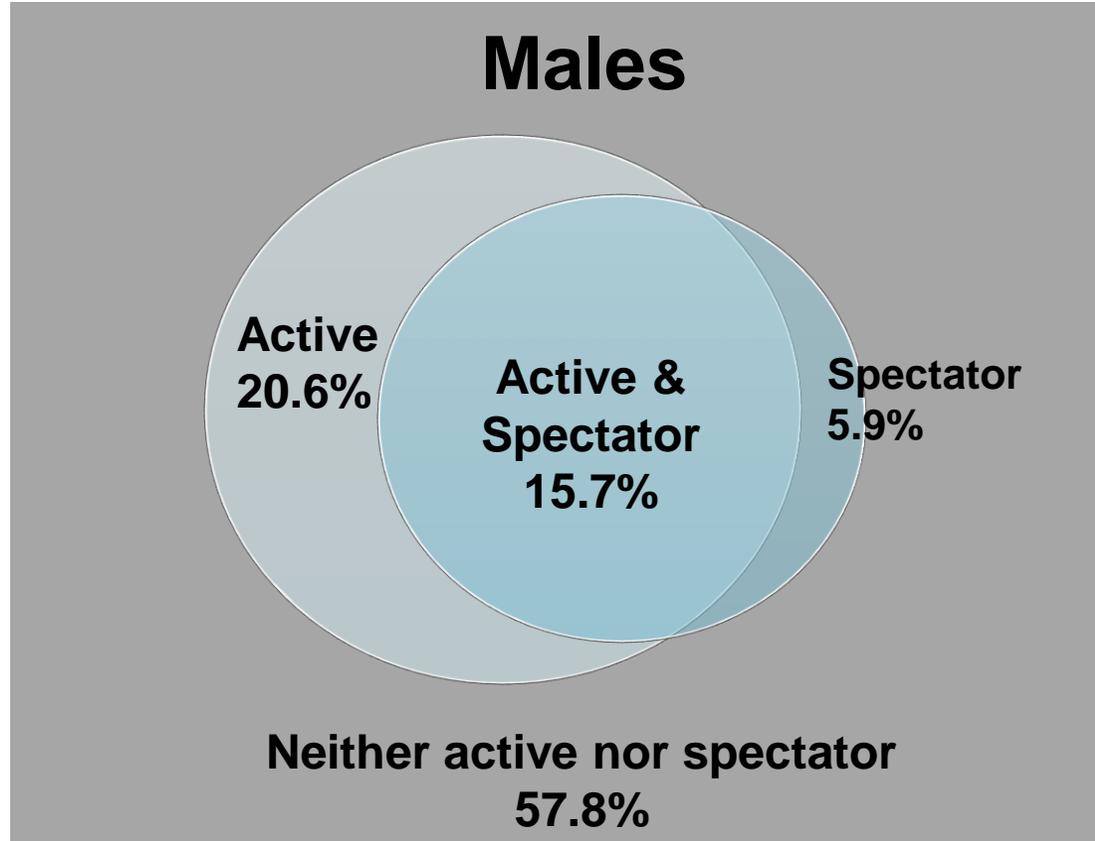


Intergenerational continuity

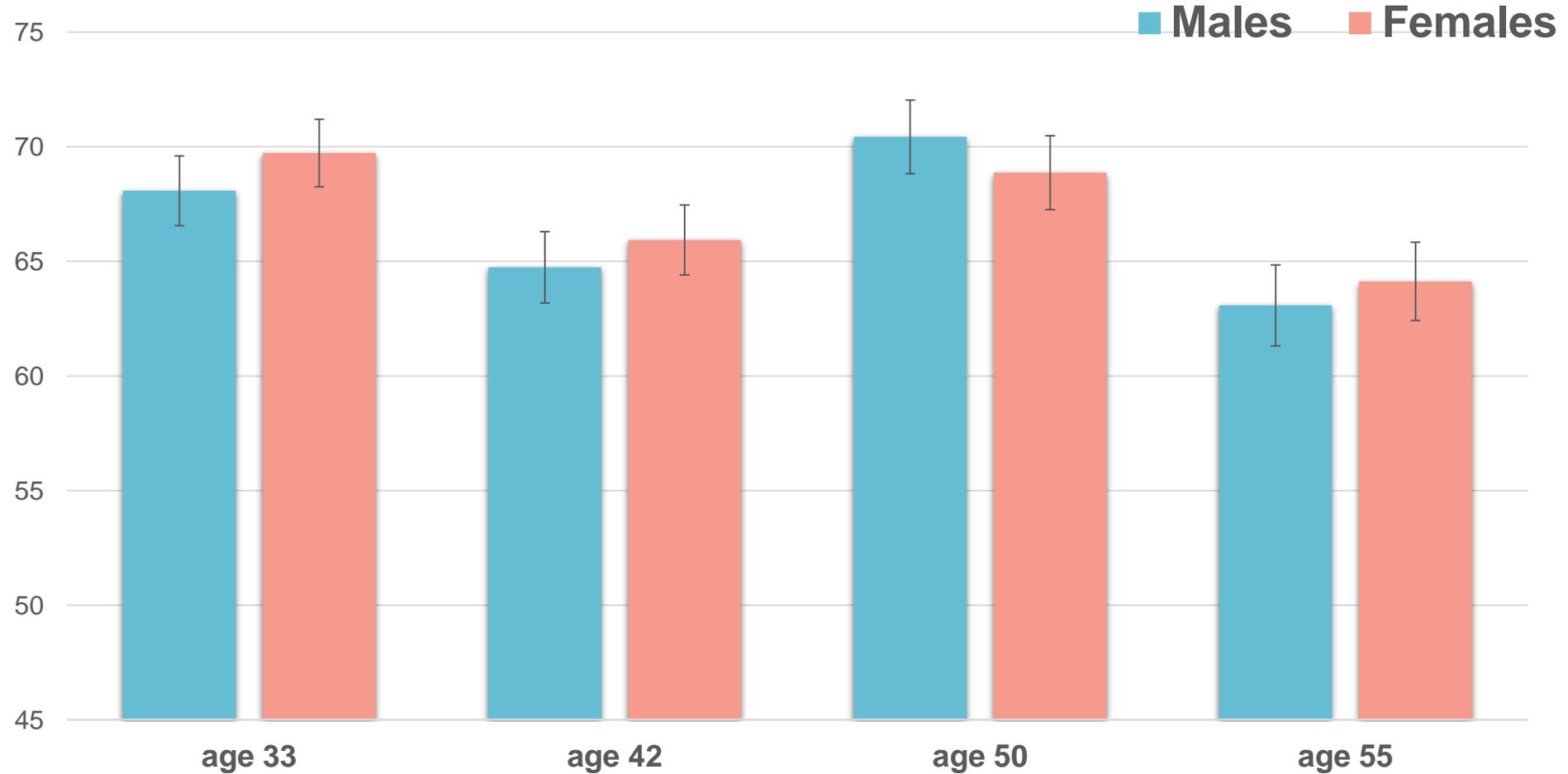
“....] when it is a hour to go to work I go out to play a game with my son Royston he is fond of football. He is in goal with the wind blowing toward me and I am in goal when it is blowing toward him [....]”
(Male: Active)



Physical activity mentions in the age 11 essays

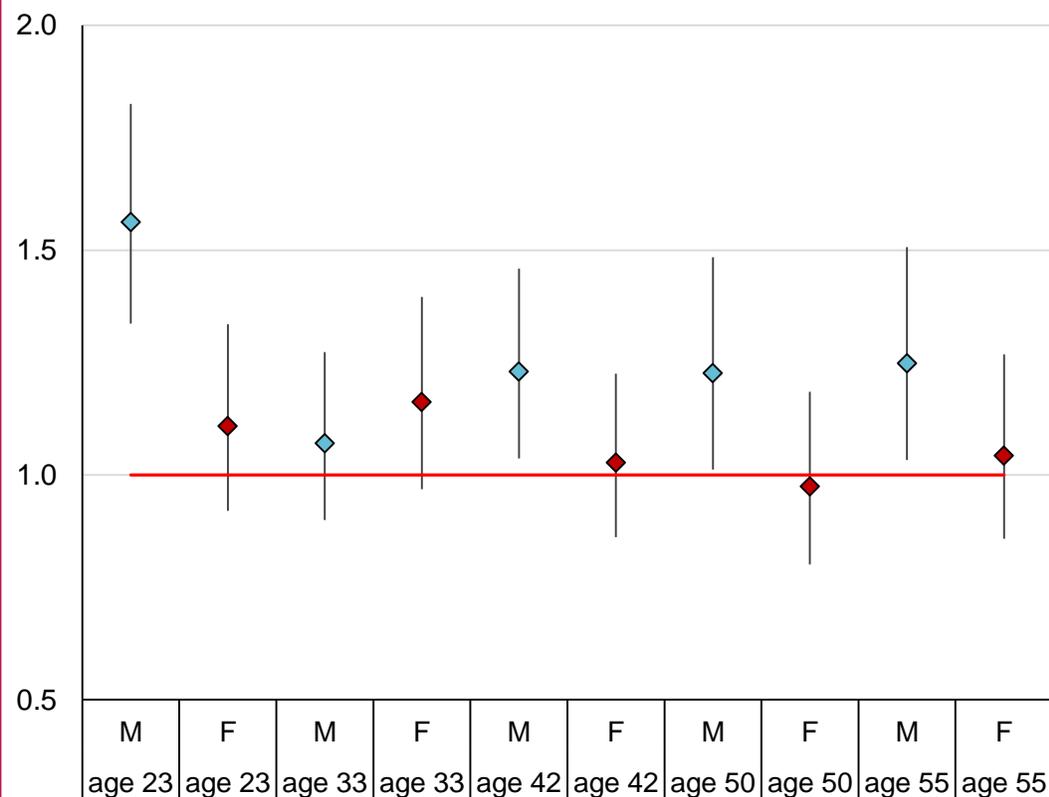


Proportion of respondents exercising once a week or more, across adulthood by gender

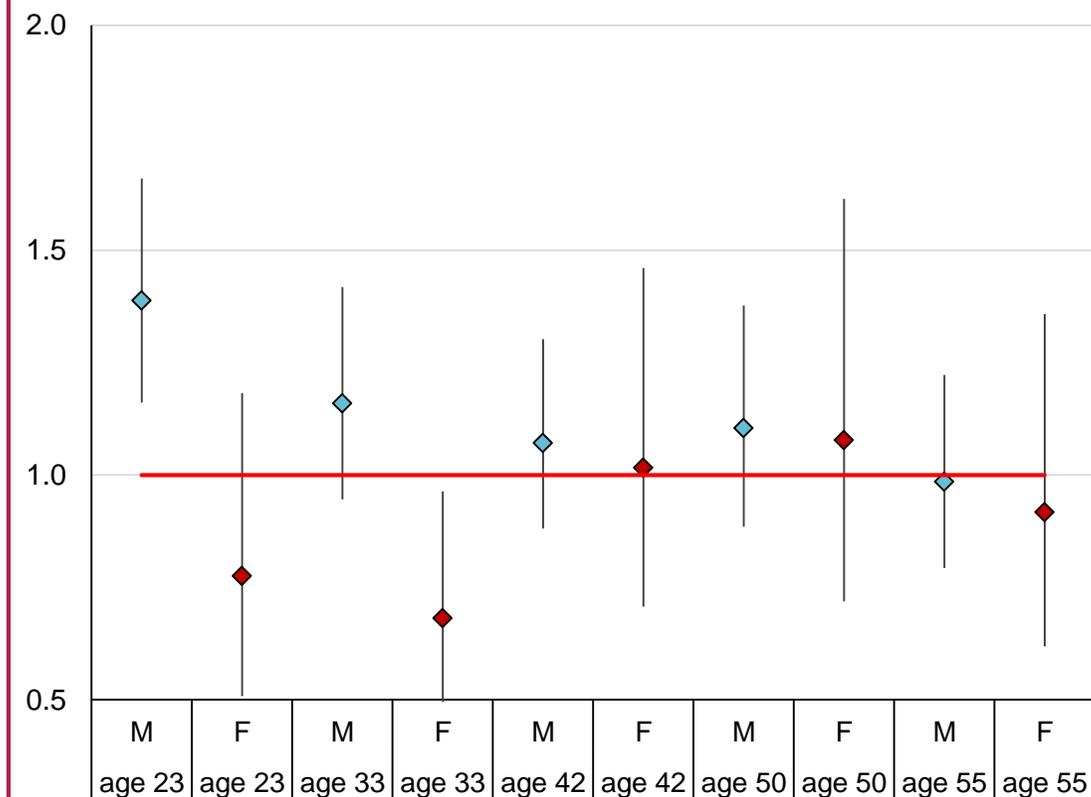


Mentions of active sport in the essays predicts later activity for men

Odds ratios of being **active** across adulthood for active identity projection at age 11



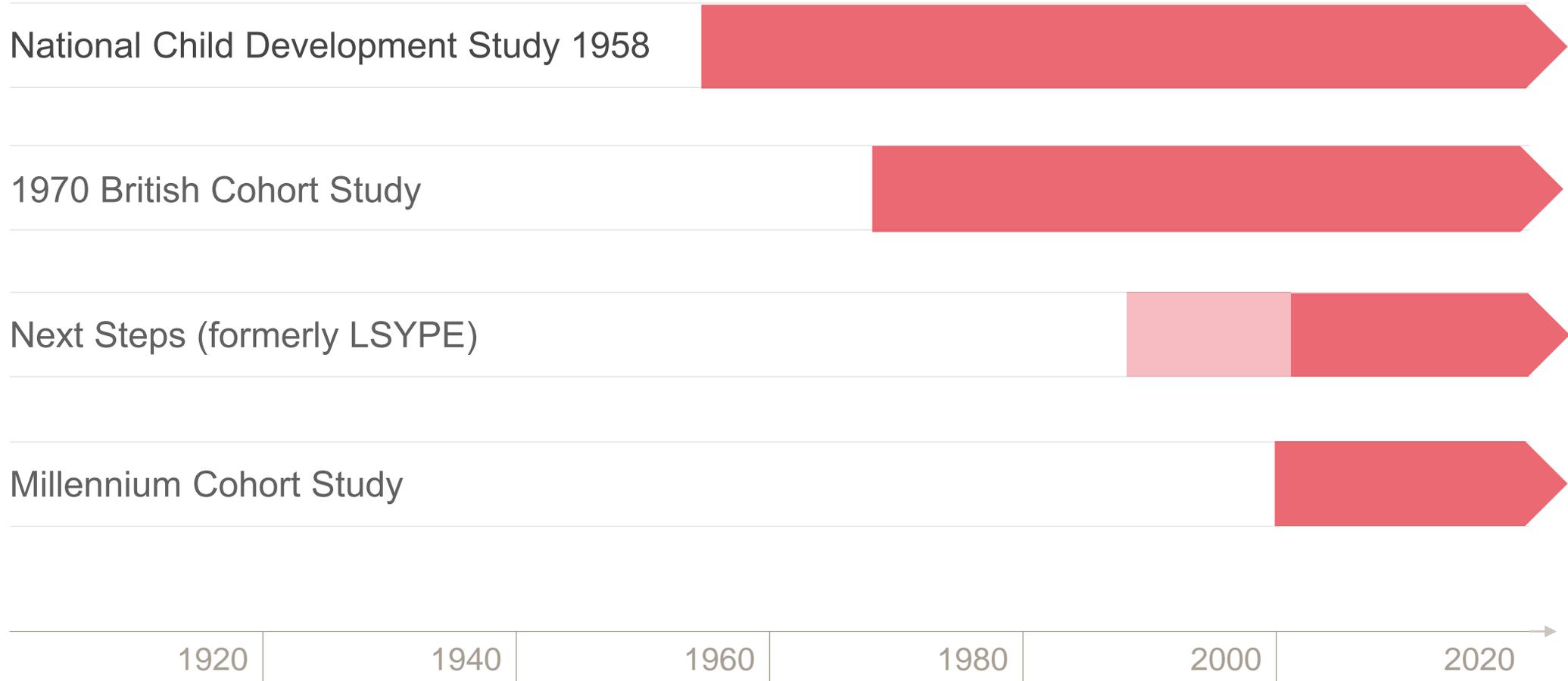
Odds ratios of being active across adulthood for **spectator** identity projection at age 11



Conclusions

- Linguistic features do predict outcomes later in life.
- They provide additional information even beyond the rich survey data that was collected.
- Implications for research: big data like this cannot replace surveys but can be useful to augment them, or when none available.
- Implications for policy – interventions in childhood that go far beyond writing styles...

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