Institute of Education

UCL

Race, Ethnicity and Science: Exploring the Community Cultural Wealth of BME Pupils in KS3 and KS4

Dr Christine Callender, UCL Institute of Education

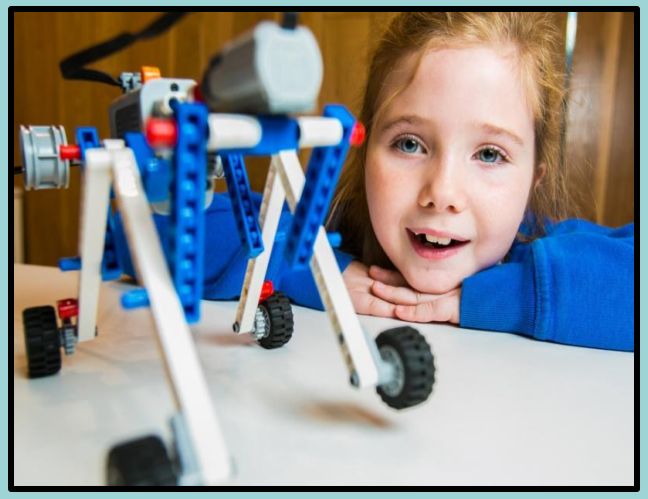
Dr Amanda McCrory, UCL Institute of Education

Dr Gideon Sappor, UCL Institute of Education

Jaqueline Lewis, Roehampton University

University of Roehampton London


MONEY



Rationale

- Science capital for whom? (ethnicity, social economic groups, intersectionality, privilege)
- Science aspiration and access to science careers for BME students
- Student agency
- Deficit model – choice V rationing

University of Roehampton London

Science Capital (Archer et. al, 2013)

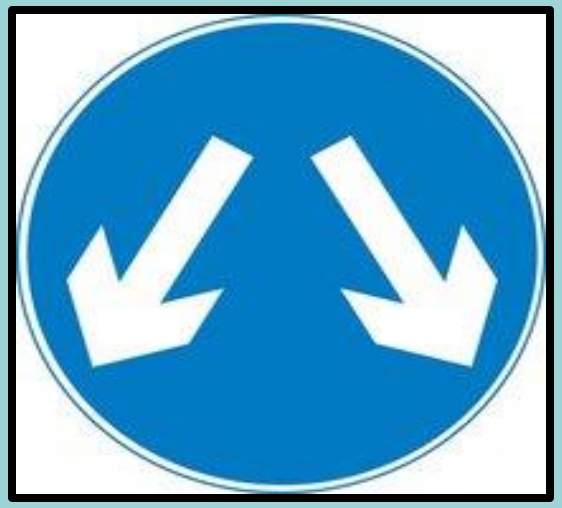
(Social Capital; Bourdieu, 1997)

- Science capital itself is a measure of your engagement or relationship with science, how much you value it and whether you feel it is 'for you' and connected to your life. It highlights: significance of **what you know** about science, **how you think** about it, **what** (science related activities) **you do** and **who you know** in shaping attitudes and feelings about STEM.
- Higher levels of science capital, it is argued, makes it more likely to lead to science careers according to Archer et al. (2013).

Perception versus reality?

Archer, Dewitt and Osborne (2014) whose small-scale study on parental views of science and science careers argue that for many BME pupils, STEM does not constitute a “thinkable” career option and, that there is a need to support BME families in developing knowledge and confidence in science.


STOP



Institute of Education

UCL

Social reproduction or social transformation?

University of Roehampton London

Contexts of schools (sub-sample)

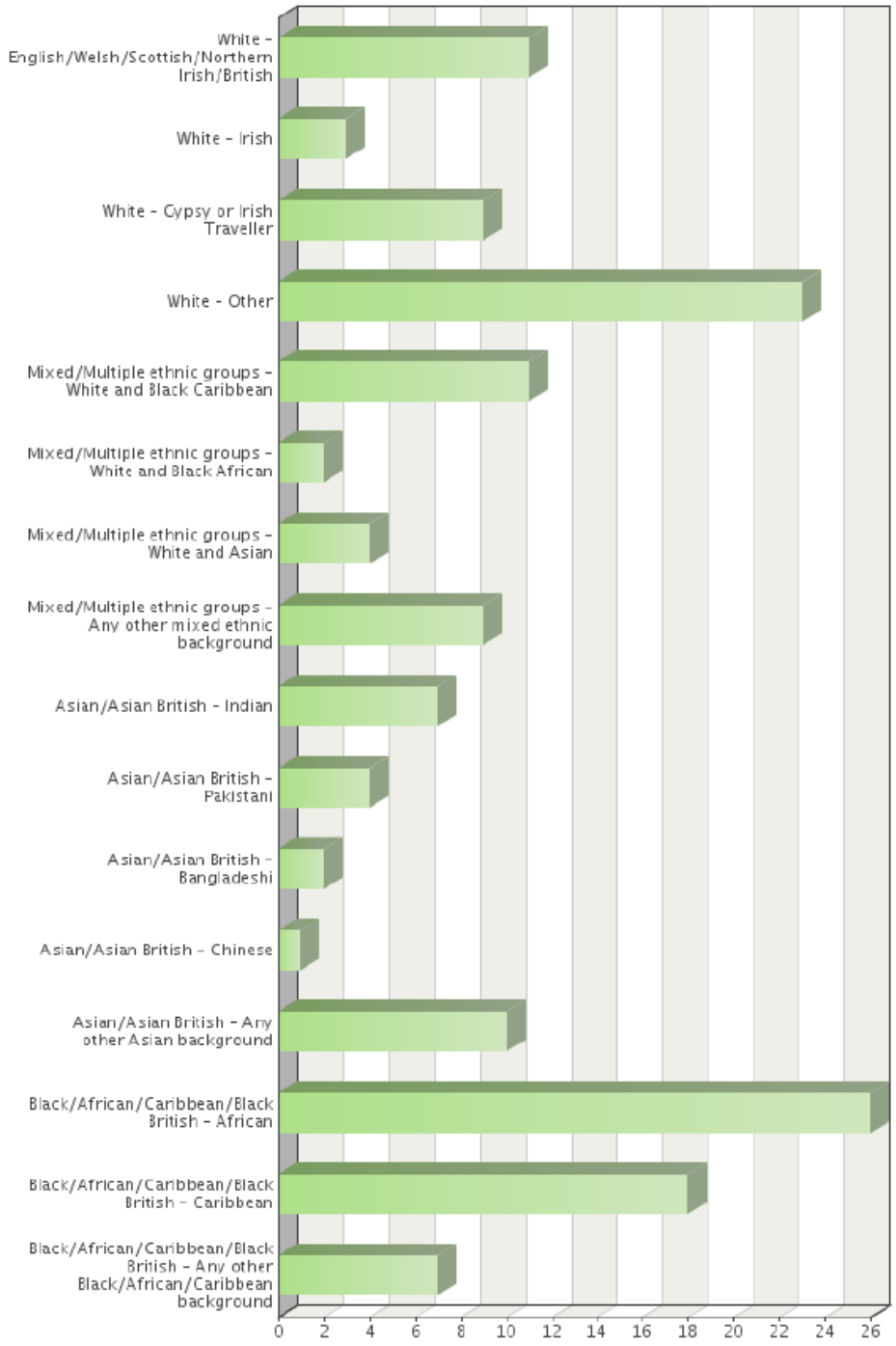
School A

- Smaller than average-sized Secondary Academy
- Pupil premium high >33%
- Specialises in science and performing arts
- Church of England
- FSM twice national average
- Above average EAL
- >85% BME

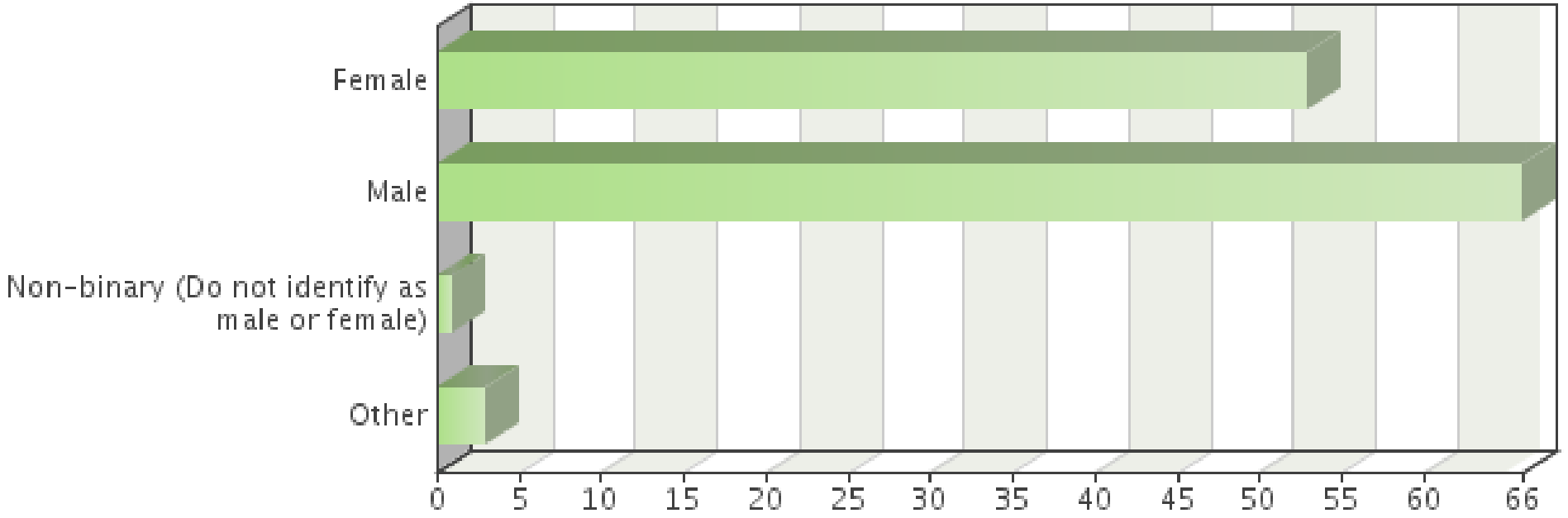
School B

- Larger than average-sized secondary
- Pupil premium 51.8%
- Recently converted to an Academy
- Serves a very deprived wards
- 70% EAL
- >95% BME

Participant demographics (questionnaire)

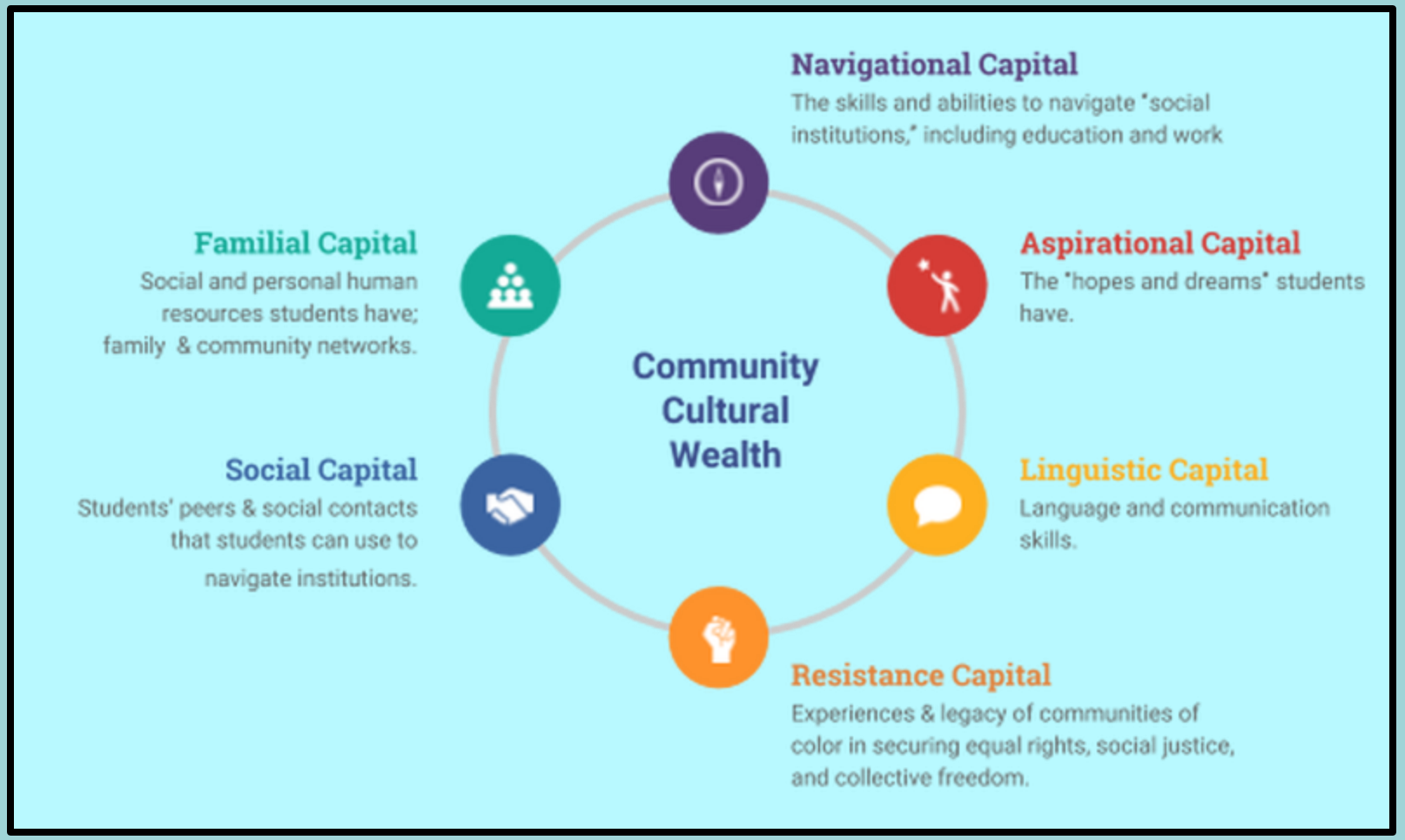


Participants by gender (questionnaire)



Theoretical Lenses

- Community Cultural Wealth (Yosso, 2005)
- Funds of Knowledge (Gonzalez and Moll, 2005)


Navigational Capital
The skills and abilities to navigate "social institutions," including education and work
Aspirational Capital
The "hopes and dreams" students have.
Linguistic Capital
Language and communication skills.
Resistance Capital
Experiences & legacy of communities of color in securing equal rights, social justice, and collective freedom.
Social Capital
Students' peers & social contacts that students can use to navigate institutions.
Familial Capital
Social and personal human resources students have; family & community networks.
Community Cultural Wealth

Funds of Knowledge

All students come to school with:

- valuable knowledge
- abilities
- sets of information

Not IN SPITE OF cultural backgrounds

But BECAUSE of them!

Research Questions

- What types of community cultural wealth do BME pupils rely on through their KS4 and KS5 science courses?
- How do different types of capital contribute to student aspiration and success in science?
- Do differences emerge amongst pupils from different ethnic minority groups?
- What differences emerge at the intersection of race/ethnicity, gender and class?

Methodology

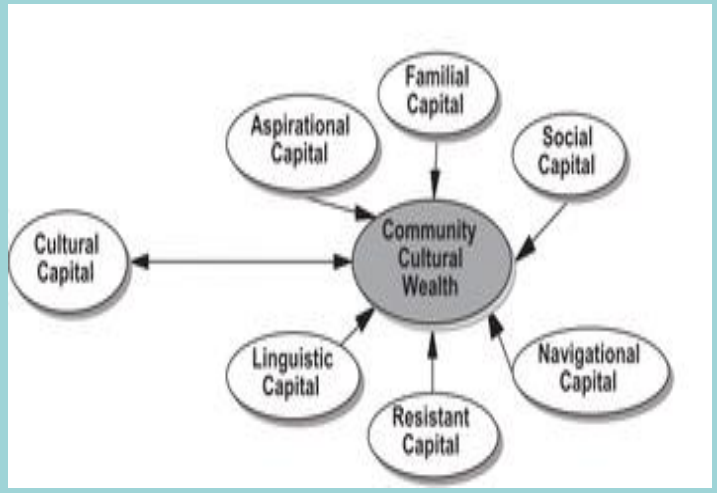
- Purposive sample from 10 secondary schools
- Questionnaires to all children, parents and science teachers of Y9/10/11 (n=150)
- Random sampling sub populations of students (n=35) and science teachers (n=12) interested in being interviewed
- Semi-structured interviews (community cultural wealth, science career aspirations)

Data Analysis – Thematic Analysis

Systematic step-by-step process
(Braun and Clarke, 2006)

Apriori codes
(Feraday and Muir-Cochrane, 2006; Yosso, 2006).

Inter-rater reliability
(Cohen, Morrison and Manion, 2014)



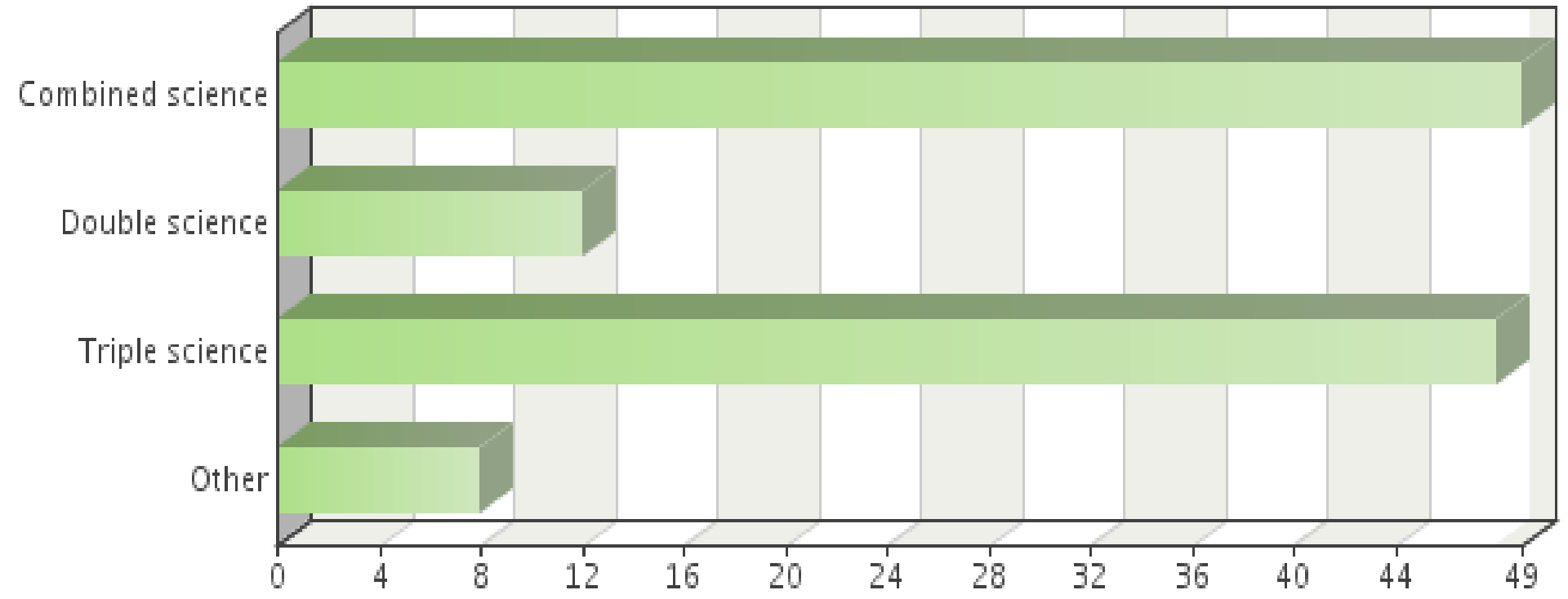
Overarching Findings

Certain forms of capital clearly evident

- Aspirational capital
- Familial capital
- Navigational capital
- Social capital
- Linguistic capital
- Resistant capital

Science Syllabus

Rationing? Teacher expectations?



Hidden ceilings, tiers and tears and flaws (Gilborn and Youdell, 2000)

- Low aspirations from teachers for some
- Resource issues in schools
- Navigational issues
- Rationing
- Deficit thinking
- Hidden ceiling
- Educational triage – are children suitable cases for treatment?
- RSA science choices

Because I feel science is a very good line to take because it helps humanity. It helps fulfill the needs of society.

I want to do something with AI or computer science because… it's like the future and cool.

I'm Asian, it was destined before I was even born. When I was a kid, it was still the thing that you just become a doctor because you're Asian. There are less bragging rights if you're an Asian mum to talk about your kids being a nurse.

I think my family is quite a supportive family. They will support me in any direction. The two people who support me the most in going into science are probably my grandad and my dad. My grandad mainly because he has a maths brain. He has a PhD in maths.

I'd say no one because I think I'm an independent learner. I don't see why I would ask someone for help because in my GCSE's it' going to be just me.

UCL

Conceptualising community cultural wealth in relation to science aspirations?

1. Reproduction or Transformation?
2. Additive Model NOT Deficit- valuing funds of knowledge
3. How is value conceptualised and by whom?

University of Roehampton London

Next steps

- Data collection phase 2 - primary
- Secondary data analysis
- Differences in and between schools
- Further statistical analysis
- Amend interview protocol resistant and linguistic – navigational

TRANSFORM THE NARRATIVE

References

Archer, L., Osborne, J., DeWitt, J., Dillon, J., Wong, B., & Willis, B. (2013). ASPIRES: Young people's science and career aspirations, age 10–14. London: King's College, 11, 119-132.

Bourdieu, P. (1997) The forms of capital. In: halsey, AH, Lauder, H, Brown, P. (eds) Education: Culture, Economy, Society, pp. 46-58. Oxford: Oxford University Press.

Gilborn, D., and Youdell, D. (2000) Rationing education. Open University Press.

Moll, L., Amanti, C., Neff, D., and Gonzalez, N. (1992) Funds of Knowledge for Teaching: Using a Qualitative Approach to Connect Homes and Classrooms. Theory into Practice. *Qualitative Issues in Educational Research*, Vol. 31 (2): 132-141.

Vincent, C. (2001) Social class and parental agency. *Journal of Educational Policy.* 16 (4), 347-364.

Yosso, T. J. (2005). Whose culture has capital? A critical race theory discussion of community cultural wealth. *Race ethnicity and education*, 8(1), 69-91.