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What does a physics student need to do to succeed? The impact of social norms on behaviour and authenticity

Amy Smith, PhD student in Physics Education

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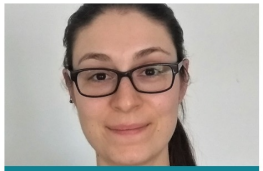
Strengthening Learning Communities

- Part of the Physics Education Group
- 4-year project funded by the Pedagogy Transformation Fund

- Investigating attainment gaps within physics
- PhD broadly focused on sense of belonging

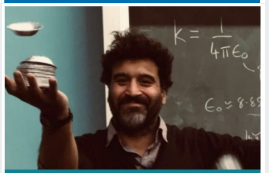
Michael Fox - Senior Teaching Fellow

Camille Kandiko Howson - Associate Professor of Education



Jessie Durk - Research Associate

Mark Richards - Senior Teaching Fellow



Vijay Tymms - Principal Teaching Fellow

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Stereotypes and social norms

A stereotype is “a generalised belief or preconception about a particular category of people”

A social norm is “a generally **accepted** way of thinking, feeling, or behaving that is **endorsed** and **expected** because it is perceived as the right and proper thing to do

Subjective social norms

Descriptive norms are **what most people in a group think, feel, or do**

Injunctive norms are **what most people in a group approve of**

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Research Questions

What are students' behavioural beliefs related to study?

What are students' normative beliefs related to study?

How do these beliefs influence student behaviour and authenticity when becoming a physicist?

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PhD Overview

JANUARY 2021

PhD Start
Literature review

AUGUST 2021

Ethics approval

OCTOBER 2021

Questionnaire #1

FEBRUARY 2022

Focus Groups #1

- 2024

Longitudinal repeats of questionnaire and focus group

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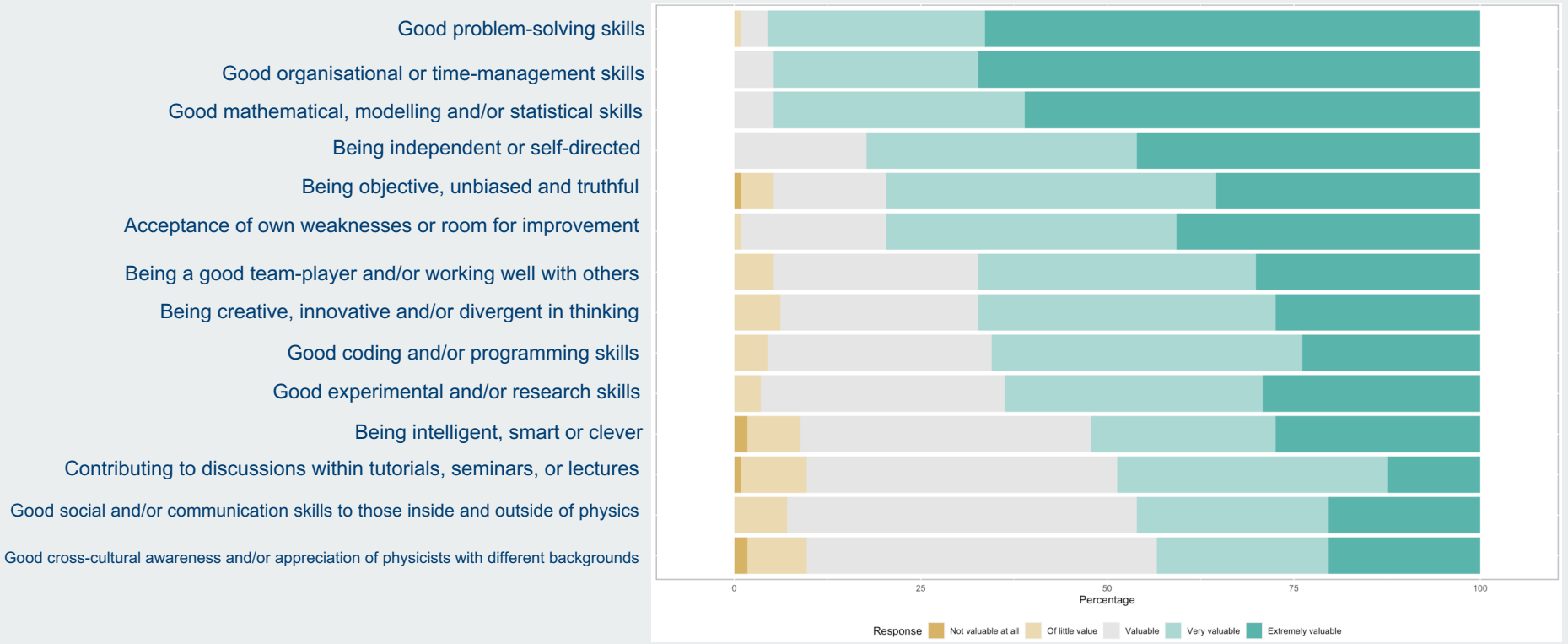
Q: What behaviours do you think are valuable for a physics student at Imperial College London? (behavioural beliefs)



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The value of work ethic

> It's very dangerous to go way too much, right? Like it's good to have sociable stuff, because I find myself not even thinking of that, I kind of avoid it without thinking of it…**I do come close to something maybe unhealthy**

- Ambition to get **“best grade they can”**
- Strong work ethic and organisational skills necessary
- Work-life balance difficult to maintain

> It's always like a constant journey for me to be like the **best physics student ever.**

What's perceived to be the norm

- Students accepted there was a range in learning behaviour of close friends…
- …but still perceived that as a whole, their cohort are **very hard-working**

- Observations of cohort mainly through WhatsApp and seminars

> In term one everyone was super on top of everything….I felt like imposter syndrome did kick in for me. Because it was like, I'm not doing as much work as these guys say they're doing?

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Competition

> Yeah there's always someone doing more work than you. There's always the pressure like, maybe I should be doing as much as they are. Maybe that's what I need to be doing. And then things will click into place.

- Students perceived grades to be a **zero-sum game**
- **Non-examined course material** create an environment of “there’s always more you can do”

> we can't all succeed no matter how well we're doing.

Collaboration

- **Lack of feedback** so difficult to judge position
- **Study groups** fundamental to ‘get of your own head’ and accurately compare

- Students also bonded over **shared difficult experience**

> I mean, we're all doomed, but at least we're in it together, right?

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Authenticity

> I try to take conversations like about what other people do, especially on the group chat with a grain of salt

- Students experience **change in expectations** after exams
- Ability to be **more authentic** as less pretending to be “the best” or ”on top of it all”
- Some students had awareness that **perceptions of the norm could be “false”**

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Research Questions – Key findings

What are students' behavioural beliefs related to study?	What are students' normative beliefs related to study?	How do these beliefs influence student behaviour and authenticity when becoming a physicist?
1. Discipline based skills are seen as valuable **but expected** 2. Independence and time-manangement **and work ethic** are seen as valuable	1. Perception of homogenity in **valued beliefs** 2. **Perception that cohort has high work ethic** 3. **...partly fuelled by high levels of "extra-curicculur" physics & scaling**	1. **Pressure to compete and "match" peers** 2. **...partly due to zero-sum game mentality** 3. **...which is worsened when students don't have access to peer groups**

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Thanks!

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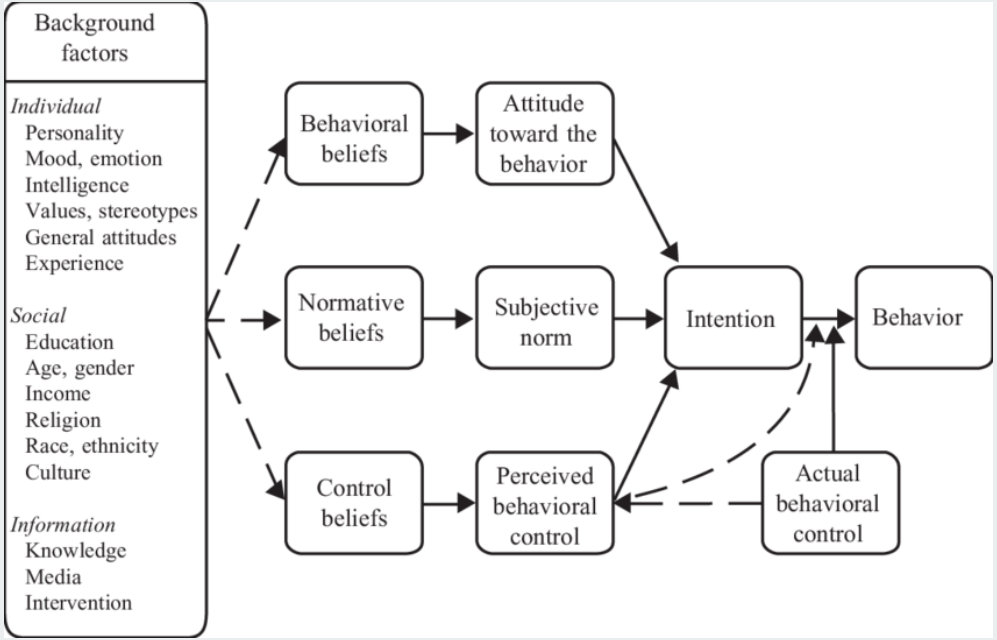
Theory of Planned Behaviour



(Azjen, 1991)

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Worry about appearing smart

- Many students described how they were afraid of asking questions because they were worried the question was stupid or silly
- Some felt this only with peers and were able to go to office-hours, whereas others felt it with peers and professors

"I definitely think it's very easy to assume that the loudest person in the class is the smartest. It's not necessarily true, but it's easy to think that

"I think this is a big thing. I've definitely talked about this with a lot of people. **A lot of people just won't interact, and share opinions, just because they're scared of being wrong**…**they think that everyone *knows* the right answer**. And then if they say the wrong answer, it's like, they'll be looked at differently…**I guess it comes down to feeling like not worthy**. Yeah, I think it all stems from that fact: **not being good enough to study physics or even study physics here**. I think that is part of the problem"

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Questionnaire

42% completion rate

Demographic information[1] approximately matches cohort

[1](gender, race, fee-status, schooling, SSES)

Focus Groups

- In person
- 3 focus groups
- ~50 minutes each
- 10 students in total

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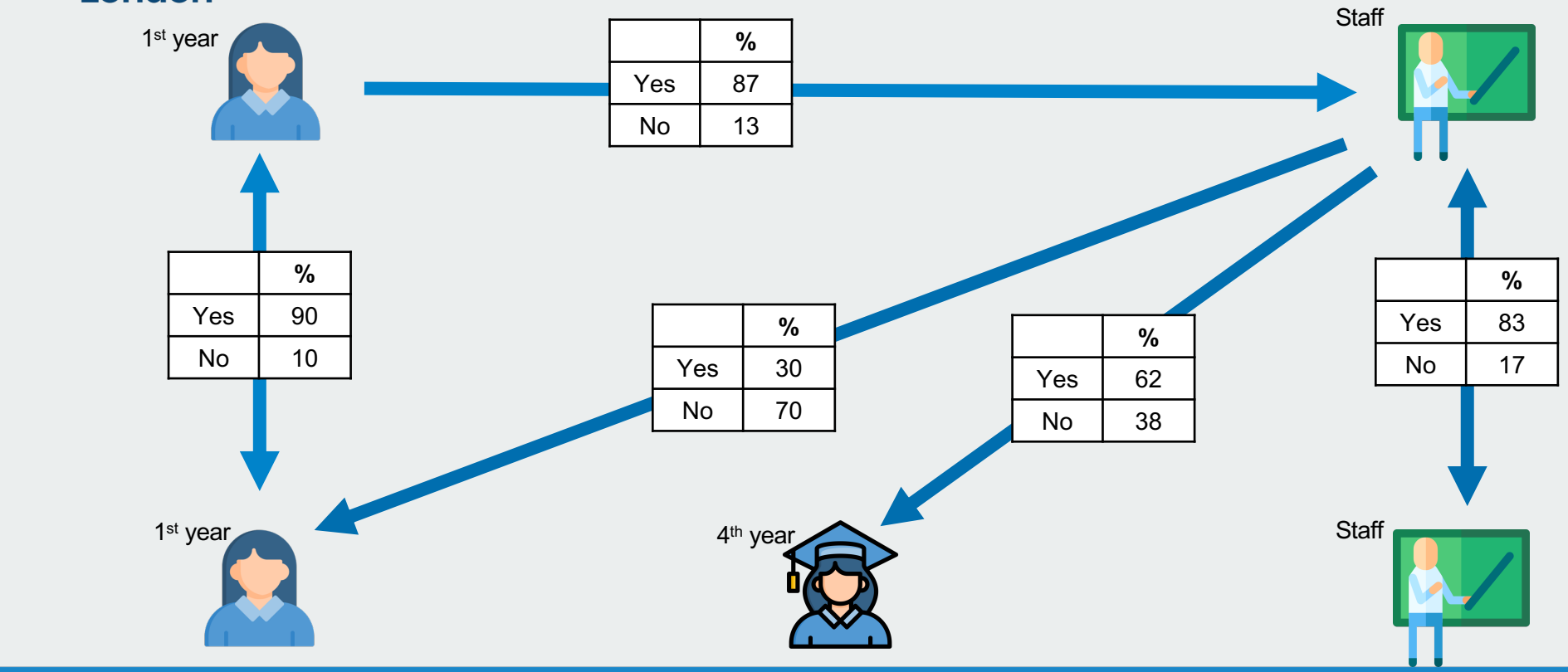
Q: Do you think that others would rate the skills and behaviours in the same way? (normative beliefs)



	%
Yes	87
No	13

	%
Yes	90
No	10

	%
Yes	30
No	70

	%
Yes	62
No	38

	%
Yes	83
No	17

Number of 1st year respondents = 94
Number of staff respondents = 46