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“The whole is greater than the sum of its parts” How well do the individual questions within the National Student Survey explain overall satisfaction?

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ABSTRACT

The National Student Survey is an annual survey of all final year undergraduate students, asking questions about their undergraduate study ranging across 8 dimensions, including “Teaching on my course”, “Assessment and Feedback”, “Academic Support”, “Organisation and Management”, “Learning Resources”, “Learning Community” and “Student Voice”.

We use within-university variation across the subjects of Economics, Physics and Medicine to estimate firstly the relationships between response rates and overall satisfaction, and secondly the relationship between overall satisfaction and the individual component questions.

Our results are in line with previous literature in this area and suggest that the key determinants of overall student satisfaction are perceptions of “Teaching on my course”, and “Organisation and Management”, whilst the role that “Assessment and Feedback” plays is uncertain, with negative results found (since 2017) for both Economics and Physics. We also find significant heterogeneity relating to the sensitivity on individual questions, such as the ability to contact staff when needed, which is a positive predictor of overall satisfaction in medicine, but not in Economics or Physics.

Whilst response rate is strongly correlated with overall satisfaction both overall, and within University, this effect is purely predictive and not causal. We show that, for Economics, response rate is particularly predicted by organisation and management, and is negatively related with satisfaction in assessment and feedback.

1. Introduction

The National Student Survey (NSS) is an annual survey of all final year undergraduate students in the UK. Students are asked about their overall satisfaction with a range of characteristics of their undergraduate degree, and until 2022, students were asked about the overall satisfaction of their undergraduate degree.

However, little research has been done to investigate the determinants of overall satisfaction. This paper seeks to determine what characteristics of a student’s experience are determinants of overall satisfaction. In the presence of potential halo effects (see, for instance, Thorndike (1920)), overall satisfaction can be a useful measure to focus upon. However, since 2023, the OfS have stopped

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asking the overall satisfaction question, and so this research is important, as it provides an indication of key areas of focus to help improve students' holistic experience at University.

Within the NSS, students are asked about their overall satisfaction with a range of characteristics of their undergraduate degree, including measures relating to teaching, assessment, learning resources, and organisation and management. However, up until 2022, the headline figure that was used was the overall satisfaction.

The headline figure that is used, and published, most often is the proportion of students who are satisfied with their course, but the survey also probes a range of other characteristics, including assessment and feedback, academic support, and organisation and management.

There is very little research examining the relationship between characteristics measured within the NSS. Key exceptions are Burgess, Senior et al. (2018), Langan, Dunleavy et al. (2013) and Langan and Harris (2019). However, most of these analyses focussed solely on either bi-variate, or conditional correlations, without attempting to evaluate causation, and are focussed on pre-2017 NSS questions. Satterthwaite and Vahid Roudsari (2020) is a key exception in using post 2017 data, but only focusses on a single year, and examines bi-variate correlations.

In addition, institutions often focus on gaining high response rates as a way of trying to improve overall stated satisfaction. However, Burgess (2018) points out that there is a weak correlation between response rates and overall student satisfaction, which has been diminishing over time. Response rates are likely to be endogenous, with either very satisfied, or very unsatisfied students more likely to respond. To the authors' knowledge, there is little causal evidence of the effect of response rates on satisfaction.

Our paper contributes to the current research in various ways:

1. it uses the NSS data over the 2010 – 2021 period by taking into consideration the change in the design of the NSS questionnaire from 2017;
2. it investigates whether the response rate has any role to play in determining students' satisfaction and
3. focuses primarily on economics as the main subject of the investigation.

2. The National Student Survey

The first full National Student Survey (NSS) was conducted in 2005 at higher education institutions in England, Wales and Northern Ireland. It has been conducted on an annual basis in subsequent years, with some institutions in Scotland opting into the survey in 2006 and 2007.

Initially, the NSS consisted of 21 questions relating to various dimensions of students' experience, and a final question, relating to overall satisfaction. These questions included ratings on Teaching on My Course, Assessment and Feedback, Academic Support, Organisation and Management, Learning Resources, and Personal Development. All students were asked a final question (Q22), asking them about their overall satisfaction. "Overall, I am satisfied with the quality of the course".

In 2017, there was a significant refresh of the question sets used, to better reflect the needs of students (Office for Students, 2020). This led to the removal of the Personal Development section, and the introduction of a set of questions on Learning Opportunities, Learning Community, and Student Voice. In addition, some of the questions were marginally re-worded. For example, Q7 "Feedback on my work has been prompt" was rewritten to Q10 "Feedback on my work has been timely", changing the emphasis from speed to feedback to providing feedback at the most appropriate time. Overall, the reforms in 2017 led to an increase in the main bank of questions to 26 questions, with Q27 now representing the overall satisfaction of students. The full set of questions used in the surveys, both pre- and post- 2017 are detailed in Table 1

In the NSS, individuals indicate how strongly they agree with 22 (27) statements on a Likert scale, classifying as Definitely agree (5), Mostly agree (4), Neither agree nor disagree (3), Mostly disagree (2) and Definitely disagree (1). Students were defined as satisfied if they selected either "Definitely agree (5)" or "Mostly Agree (4)" for a question. The overall results, including the proportion of students choosing each option is published in July of each year, with many institutions (including the media) using the proportion of satisfied students to indicate students' evaluation of their undergraduate experience.

The NSS was developed as part of the revised Quality Assurance Framework for higher education with the aims a) to inform the choices of future students, alongside other sources of information about teaching quality and b) to contribute to public accountability by supporting external audits of institutions by the QAA (Surridge, 2008). Thus, from its inception the NSS has had multiple purposes and been required to inform multiple audiences.

The NSS data are currently used for various purposes. Amongst others, these include:

1. An internal measure of teaching quality, for the purposes of improving teaching quality.
2. Contributing towards the Teaching Excellence Framework¹ (TEF), providing an externally facing "rating" of Higher Education institutions.
3. Determining league tables, published by external providers, and through key information sets to help students choose institutions based upon teaching quality.

¹ The Teaching Excellence Framework was introduced in 2017, to provide an overall rating of the quality of education at each institution. Institutions are ranked as gold (the highest rating), silver or bronze. The NSS scores achieved in each institution contribute towards the overall rating that the institution gains.

Table 1
Questions in the NSS.

Section	2005 – 2016 questions		2017 – 2022 questions	
	Question number	Statement	Question number	Statement
Teaching on my course	1	Staff are good at explaining things	1	Staff are good at explaining things
	2	Staff have made the subject interesting	2	Staff have made the subject interesting
	3	Staff are enthusiastic about what they are teaching	3	The course is intellectually stimulating
Learning opportunities	4	The course is intellectually stimulating	4	My course has challenged me to achieve my best work
			5	My course has provided me with opportunities to explore ideas or concepts in depth
			6	My course has provided me with opportunities to bring information and ideas together from different topics
			7	My course has provided me with opportunities to apply what I have learnt
Assessment and feedback	5	The criteria used in marking have been made clear in advance	8	The criteria used in marking have been clear in advance
	6	Assessment arrangements and marking have been fair	9	Marking and assessment has been fair
	7	Feedback on my work has been prompt	10	Feedback on my work has been timely
	8	I have received detailed comments on my work	11	I have received helpful comments on my work
	9	Feedback on my work has helped me clarify things I did not understand		
Academic Support	10	I have received sufficient advice and support with my studies	12	I have been able to contact staff when I needed to
	11	I have been able to contact staff when I needed to	13	I have received sufficient advice and guidance in relation to my course
	12	Good advice was available when I needed to make study choices	14	Good advice was available when I needed to make study choices on my course
Organisation and Management	13	The timetable works effectively as far as my activities are concerned	15	The course is well organised and running smoothly
	14	Any changes in the course or teaching have been communicated effectively	16	The timetable works efficiently for me
	15	The course is well organised and is running smoothly	17	Any changes in the course or teaching have been communicated effectively
Learning resources	16	The library resources and services are good enough for my needs	18	The IT resources and facilities provided have supported my learning well
	17	I have been able to access general IT resources when I needed to	19	The library resources (e.g. books, online services and learning spaces) have supported my learning well
	18	I have been able to access specialised equipment, facilities, or rooms when I needed to	20	I have been able to access course-specific resources (e.g. equipment, facilities, software, collections) when I needed to
Personal Development	19	The course has helped me to present myself with confidence		
	20	My communication skills have improved		
	21	As a result of the course, I feel confident in tackling unfamiliar problems		
Learning Community			21	I feel part of a community of staff and students
			22	I have had the right opportunities to work with other students as part of my course
Student Voice			23	I have had the right opportunities to provide feedback on my course
			24	Staff value students' views and opinions about the course
			25	It is clear how students' feedback on the course has been acted on
			26	The students' union (association or guild) effectively represents students' academic interests
Overall	22	Overall, I am satisfied with the quality of the course	27	Overall, I am satisfied with the quality of the course

These measures of satisfaction are then used for a multitude of stakeholders; institutions can use the measures to identify where improvements can be made to undergraduate programmes, the satisfaction across various characteristics are used when rating Universities in the TEF, and there are a wide range of league tables produced (e.g. from Times Higher Education, the Guardian, and others) which use student satisfaction as a key measure of teaching quality.

The published league tables contain aggregated information across a range of factors, including student outcomes (e.g. employability), student staff ratios, and most include measures of student satisfaction. Whilst not observing a direct causal link between student satisfaction and student demand, there is evidence that students' decisions about University programmes are influenced by

league table positions. Gibbons, Neumayer et al. (2015) identify a small relationship between league table scores and student demand, with a greater elasticity illustrated for higher ability applicants and highly competitive programmes, whilst Chevalier and Jia (2016) find that a 1 s.d. increase in league table position is associated with a 4.3% increase in overall student demand, with the impact larger on international students (7.4%)

This, along with the desire to gain the highest ratings within the TEF, produces extrinsic motivation for institutions to gain the highest possible NSS scores, even if this comes through poor practices, such as awarding higher grades. (Stroebe, 2020).

Initially, institutions performance in the TEF, influenced by the NSS, was going to be linked with the ability to raise fees for home students. This led to a campaign from the National Union of Students to boycott the NSS in 2017. Since NSS results are only published where there is a response rate greater than 50%, this led to a number of programmes and institutions failing to have a sufficiently large response rate for data to be published. We detail the impact of the boycott in our discussion of the results below.

The importance of the NSS, and its impact on student demand, particularly from international students, provide clear, extrinsic, motivation for institutions to understand the determinants of student satisfaction, and to work to improve those metrics.

The focus of this paper is the period from 2010 to 2021. However, it should be noted that the question sets used for the NSS was revised in 2023, with the Likert scale being reduced from five to four options, effectively removing the “neither agree nor disagree option”, and further removing the overall satisfaction question. We leave analysis of the revised NSS for further research.

3. Literature review: what factors determine student satisfaction in the NSS?

Whilst there has been little work examining the inter-relatedness of dimensions of student satisfaction, there has been wider work on overall student satisfaction.

One key finding is that student satisfaction may be related to a wide range of characteristics, unrelated to the quality of teaching. For example, observed characteristics such as employability, entry standards, student staff ratio, whether the university is on a campus (Lenton, 2015) have positive impacts on satisfaction, whilst increased casualisation is associated with lower levels of satisfaction (Williams, 2021). These aspects are important, as halo effects (Thorndike, 1920) may mean that high satisfaction with the physical infrastructure of the University may lead to high satisfaction rates elsewhere. Similarly, students may rate programmes higher in the dimensions of assessment and feedback based upon the grade that they receive, rather than the quality of the experience (Buckley, 2021).

The structure and quality of the programme influences students' satisfaction; programmes with practical approaches, and a greater focus on personal development tend to gain higher satisfaction (Whelan and McGuinness, 2021).

Further, the demographics of the students attending an institution may affect overall satisfaction; a number of papers used multi-level modelling to disentangle the University effect from the student demographic. Surridge (2008), Marsh and Cheng (2008) and Cheng and Marsh (2010) all conclude that the variability in satisfaction measures that can be attributed to the University is small, at between 2.5% and 4% in the overall variation, with much of the variation attributable to student demographics. For example, Fielding, Charlton et al. (2008) illustrate that, on the Assessment and Feedback scale, when interacting sex with other demographics, females from Indian and Black Caribbean groups are more positive than their male counterparts, and female students with high UCAS Tariff scores (i.e. high performance in high school) are more positive than their male peers (with similarly high UCAS scores).

A further and slightly different contribution to the research is provided by Lenton (2015) who explores students satisfaction in the NSS against a number of non-NSS determinants that include geographical, academic and financial factors such as the percentage of graduates in employment, the student-staff ratio and the cost of academic staff. The analysis uses data over the 2007–2010 for a subset of 11 subjects across 121 universities and the estimation strategy is based on a fixed and random effects panel data analysis. The evidence suggests that the student-staff ratio and the students' employability are strong determinants of students' satisfaction. Similarly, there is strong evidence of differences in NSS scores across subjects and across different groups of universities, which implies that the raw scores should not be used as a method of ranking.

3.1. Internal predictors of overall satisfaction

Our paper focusses on internal consistency within the NSS. An early paper exploring this area was Fielding, Dunleavy et al. (2010) who, using factor analysis on the 2006 NSS results, are able to support the claims of a high internal consistency of the survey. The research also shows that subject groupings display consistent differences in responses, with some subjects consistently recording higher satisfaction. In turn, according to the researchers, this reduces the usefulness of the NSS for comparing different subject groupings within a university. The researchers are also among the first to investigate the relationship between overall satisfaction and the other NSS scales and the factor analysis shows that overall satisfaction is strongly correlated with teaching, support and organisation and management and very weakly correlated with assessment and feedback and learning resources.

This initial evidence is supported by the research by Langan, Dunleavy et al. (2013) who apply machine learning techniques to the investigation of the determinants of overall satisfaction by focusing on the 2007, 2008, 2009 NSS results. The evidence shows that that the best predictor of student satisfaction nationally for the three years analysed was “The course was well designed and running smoothly” followed by ratings of “Teaching”, “Organisation” and “Support”. On the other hand, questions about feedback were the weakest predictors of “Overall Satisfaction”. The researchers acknowledge that the results may vary slightly between subjects and institutions and they suggest that the more quantitative approach to the investigation of students' satisfaction is contextualised in the individual feature of each institution or course of study. When comparing universities' performance, the research reveals that more traditional “1994” and “Russell” groups universities over-performed in a model that uses the core 21 survey questions to predict

“Overall Satisfaction”, in contrast to the under-performing newer universities in the Million+ and Alliance groups.²

The research by Langan, Dunleavy et al. (2013) is expanded by Burgess, Senior et al. (2018) who investigate the determinants of overall satisfaction by analysing all NSS responses across all subjects and universities over the 2007–2016 period.

Again, factor analysis is employed to investigate the main determinants of student’s satisfaction. The analyses show that the factor structure of the NSS remained generally stable and that the ability of the NSS to discriminate between different subjects at different universities actually improved over the ten-year sample period. The investigation of the predictors of ‘Overall Satisfaction’ is consistent with the early investigation by (Langan, Dunleavy et al. 2013) that ‘Teaching Quality’ and ‘Organisation & Management’ are the best predictors of overall satisfaction with the single best satisfaction predictor being “The course was well designed and running smoothly”. On the other hand and, again, consistent with previous research, ‘Assessment & Feedback’ has a relatively weak predictive ability. The authors conclude that, overall, student satisfaction has improved substantially over the last decade and that the NSS has proved to be a robust and stable tool over the last. The recommendation from the researchers to the university managers who wants to improve their institutional ratings is to invest on ‘Teaching Quality’ and ‘Organisation & Management’. However, with satisfaction in teaching quality reaching almost ceiling levels, the recommendation would be to place more emphasis on the smooth running and good design of courses.

Further confirmation of the evidence comes from the work by Langan and Harris (2019) who use machine learning analysis to rank the predictive power of the survey items and to evaluate how their influences have changed over time. Using NSS results for the period 2006 – 2015 across all subjects and UK Universities, the statistical analysis reveals the importance of student perceptions of course organisation, academic staff explanations and the perceived intellectual stimulation as the areas with the strongest association with “Overall Satisfaction”. The research confirms that very few other NSS survey items have any notable value in the prediction of student satisfaction.

The emerging consistent and robust evidence that students’ satisfaction is mainly driven by teaching quality and by good organisation and management has been tested further by Langan, Scott et al. (2017) who carry out a quantitative analysis of the free text (positive and negative) comments that students can add when completing the NSS. The researchers use data from the 2011/12 NSS and they categorise institutional NSS text comments into themes that mirror those of the original questionnaire. Comparisons are made between frequencies of thematic comments and the national ratings of satisfaction for several subject areas. The evidence shows consistency between the comments about measures of teaching quality and course organisation and the results emerging from previous quantitative models of the predictors of the students’ satisfaction.

3.2. Determinants of satisfaction across subjects

The investigation of students’ satisfaction across different subjects or alongside other non-NSS determinants, such as research quality or student-staff ratio, has been the subject of some recent research. Bell and Brooks (2018) use the 2014 NSS responses to systematically investigate the cross-sectional variation in responses across all subject areas and universities. They find that students of clinical subjects or humanities are most satisfied, while those on media studies and general engineering courses are the least so. From a geographical perspective, students in Northern Ireland and the Northeast are the most contented and those in London the least. The investigation of the determinants of overall satisfaction is carried out by using regression analysis and reveals that, consistently with the research summarised above, students place more emphasis on teaching, course organisation and personal development with very little on assessment and feedback. The research also shows that in pairwise comparisons of sub-groups, students on part-time degrees, at Russell Group universities, at non-specialist institutions, at universities in the QS Top 400, and at old universities, were more satisfied than in their counterparts.

The determinants of Business School students’ satisfaction are explored by Agnew, Cameron-Agnew et al. (2016) who, alongside the NSS questions, employ other explanatory variables such as student-staff ratio, spend per student, average entry tariff, value added score, percentage of students in graduate employment, index of research quality and institutional characteristics (i.e. ‘new’ vs ‘old’ universities). The researchers use the 2014 NSS results alongside factor and OLS regression analysis to carry out their analysis. The findings are consistent with the research summarised so far: among business students the quality of teaching, personal development and organisation and management are the most important determinants of overall satisfaction while assessment and feedback plays a marginal role. With respect to the other determinants of satisfaction, the evidence shows that a higher value-added score is significantly correlated with higher satisfaction scores on all four NSS indices, with the greatest effect size on the feedback and teaching quality & learning outcomes indices. Interestingly, Agnew et al.’s findings resemble those stemming from similar research on the determinants of students’ satisfaction among US business students carried out by Letcher and Neves (2010). Their investigation finds that factors such as self-confidence, extra-curricular activities, career opportunities, and quality of teaching in general are the factors with greater impact on satisfaction.

In this paper, we take advantage of a panel of NSS results between 2010 and 2021 to use a within-university (fixed effects) analysis to investigate the relationship between stated satisfaction on the various dimensions of the National Student Survey, with a focus upon students’ satisfaction in Economics, Physics and Medicine. In particular, we are interested in comparing determinants of overall student satisfaction in Economics, with satisfaction in other, technical, subjects.

We find that response rate has little impact on overall satisfaction, whilst the important determinants of overall satisfaction relate to

² The Russell Group is a group of 24 research intensive Universities including Oxford, Cambridge, Imperial, and LSE. The 1994 group is a now defunct group of smaller, research focussed institutions. The Million+ and Alliance groups consist of newer universities.

teaching on the students' course, and organisation and management. The role of satisfaction in assessment and feedback in predicting overall feedback is uncertain, with positive effects found between 2010 and 2016, and negative effects since 2017. We conclude by arguing that *whilst* overall satisfaction only provides strong conditional correlations with questions relating to teaching on students' courses and organisation and management, a substantial proportion of the variation remains unexplained, suggesting that overall satisfaction measures more about a university than the individual core questions, suggesting that overall satisfaction remains as an important signal to students about the holistic student experience, which has been lost in most recent iterations of the NSS.

4. Background and theoretical framework

As we have shown, the determinants of student satisfaction are complex. Students' overall satisfaction relating to individual characteristics (such as assessment) may be influenced by a range of factors, including their subjective experience of assessment, but also characteristics relating to the student demographic, the size of the cohort, or even characteristics of the course unrelated to assessment.

We know that there are also *halo-effects* (Thorndike, 1920), where students' evaluations in other dimensions are skewed by perceptions of quality elsewhere. For example, students may provide a high rating for a teacher's assessment and feedback based on high ratings of their teaching, although (Cannon and Cipriani, 2021) argue that, even in the presence of halo effects, the evaluations provide a useful signal. Even if two students have the same experience, differences in their characteristics are likely to be associated with different levels of (stated) satisfaction (Clark, Etilé et al. 2005). These characteristics are likely to involve aspects such as prior experience of education, which shape expectations, and individual, idiosyncratic, characteristics. In addition, there are likely to be University fixed effects, including reputation effects (Walsh, Albrecht et al. 2016) with Universities with higher reputation or history of high-quality teaching leading to higher levels of satisfaction.

4.1. Satisfaction with individual characteristics

We begin with the premise that there is an objective measure of quality, Q , that can be feasibly compared across institutions, and that individual students place a **subjective** value on this quality, based upon their own experience of that quality, interacts with their experience in other aspects of their programme, and their individual characteristics.

We can construct a model of stated (subjective) student satisfaction (S) for student i , in university j , assessing characteristic c at time t .

$$S_{ij,c,t} = f(Q_{j,c,t}, Q_{j,-c,t}, X_{i,t}, \mu_j) \quad (1)$$

where $Q_{j,c,t}$ is the true quality of delivery of characteristic c , $Q_{j,-c,t}$ is the quality of delivery of *other* characteristics, $X_{i,t}$ are individual (possibly time-varying) characteristics, and μ_j are time-invariant characteristics of the university (including reputation).

The inclusion of $Q_{j,-c,t}$ represents both spillover and halo effects. For example, staff making the subject *interesting* (Q2) is likely to also have an impact on the quality of explanation (Q1), whilst the overall halo effects mean that where a programme has high quality teaching, students may be willing to state they are *more satisfied* with assessment and feedback. As such, student stated satisfaction relating to characteristic c will provide a measure of quality of provision, albeit measured with a (non-random) error, depending on quality of $-c$, individual characteristics, and institutional fixed effects. f is therefore a mapping function that maps the inputs $(Q_{j,c,t}, Q_{j,-c,t}, X_{i,t}, \mu_j)$ onto the space $\{1, 0\}$, with 1 representing a student stating they are satisfied with characteristic c (i.e Definitely agree, or mostly agree), and 0 representing dissatisfaction.

For each characteristic, the Office for Students publishes the proportion of students who are satisfied with that characteristic, as a simple sample mean of $S_{ij,c,t}$, where m is the number of respondents, when the population size of students is equal to n ($m \leq n$).

$$\bar{S}_{j,c,t} = \frac{1}{m} \sum_{i=1}^m S_{ij,c,t} = \frac{1}{m} \sum_{i=1}^m f_c(Q_{j,c,t}, Q_{j,-c,t}, X_{i,t}, \mu_j) \quad (2)$$

University programmes select students based on (relatively static) admissions criteria; as such, there is likely to be only small variation in average student characteristics over time, so much of the student input into the *average satisfaction* is likely to be captured by the University fixed effect.

As such, $\bar{S}_{j,c,t}$ will provide a signal as to the quality of student experience within university j , but it will be measured with a (non-random) error, and, due to the spillover effects and halo effects there will be correlation between characteristics, such that $\text{cov}(\bar{S}_{j,c,t}, \bar{S}_{j,-c,t} | Q_{j,c,t}, X_{i,t}, \mu_j) > 0$.

4.2. Overall satisfaction

Since 2017, the NSS measures proportion of students who are satisfied across 26 questions in 8 dimensions (prior to 2017, the NSS consisted of 21 questions across 6 dimensions). Across both vintages of the NSS, there is a **final question** about overall satisfaction.

“Q22/Q27: Overall, I am satisfied with the quality of the course”

This final question is related to a range of factors, which will include the satisfaction relating to elements included in the

questionnaires, factors which are *not* discussed in the questionnaires, individual factors, and University fixed effects.

For simplicity, we model individuals' overall satisfaction as a linear function of the *measured characteristics* (c), the *unmeasured characteristics* k , individual characteristics, and fixed University factors, μ_j :

$$O_{ij,t} = \beta_0 + \sum_{c=1}^{c^*} \beta_c Q_{j,c,t} + \sum_{k=c+1}^{k^*} \beta_k Q_{j,k,t} + X_{ij,t} \gamma + \mu_j + \varepsilon_{ij,t}$$

where $O_{ij,t}$ is the overall satisfaction of individual i , and β_c, β_k are the relative weights of the *measured* and *unmeasured* characteristics, respectively. As with satisfaction with individual characteristics, overall satisfaction is a binary outcome variable, taking the value 1 if the student is satisfied, and 0 otherwise.

As before, the published rate of satisfaction is the sample mean of this $O_{ij,t}$

$$\bar{O}_{j,t} = \frac{1}{m} \sum_{i=1}^m O_{ij,t} \quad (3)$$

4.3. Response rates

The NSS provides a **non-random** sample of the population of students in their final year of study. Students complete the survey between January and April of their final year, and the probability $p_{i,\tau}$ of individual i completing the survey at time τ (where τ is before the end of the survey) is likely to be dependent on their individual characteristics, **and** may also be determined by their overall satisfaction (which may vary marginally within a given year, t).

$$p_{i,\tau} = h(X_i, O_{ij,t,\tau})$$

As such, response rates could be important for determining overall satisfaction rates for a University ($\bar{O}_{j,t}$). In opinion polling, it is widely believed that incumbency effects are likely to skew polling (Berinsky, 2008), with non-responders often assumed to accept the status-quo. In the example of student satisfaction survey, this could represent marginal satisfaction with the course, meaning that the determinants of non-responding may be linked with quality of the delivery.

There are a number of reasons that we might expect to see a correlation between overall satisfaction and response rates.

1. If students with particularly strong views are the first to arrive (e.g. if those who are very dis-satisfied are the most likely students to respond early), and that all other students are marginally satisfied, then it is trivial to see that efforts to increase m would pull up the overall satisfaction.
2. If the response number m is directly determined by measures of quality. For example, in years where satisfaction is high, response rates automatically increase.
3. If measures of quality are codetermined with the response rate, based in the characteristics of the individuals attending.

If 1. is true, then bias will exist in $\bar{O}$ and $\bar{S}$ as estimators of the overall satisfaction for institutions, as this will lead to non-random sampling. In addition, institutions will have an incentive to try to hit optimal response rates, through strategic marketing of the NSS to their students.

Each of these elements meant that response rates are likely to be endogenous, particularly comparing across Universities. However, because satisfaction remains fairly constant across academic years within institutions (see, for instance, Cheng and Marsh (2010)), within-institution variation should allow us to better identify the impact of response rates, although it is likely that there will still be some residual endogeneity that we cannot control for.

5. Data and methods

We are interested in investigating the determinants of overall satisfaction ($\bar{O}_{j,t}$) across a range of subjects, to determine firstly, whether response rate is linked to overall satisfaction, and also to determine the influence that satisfaction with individual characteristics have on overall satisfaction. We will also seek to determine whether these relationships are homogenous across subjects, with a focus on Medicine, Physics and Economics. We have included Physics, as a science with similar characteristics to Economics, through the use of applied mathematics. Conversely, we have included medicine to evaluate whether programmes with clinical (and significant placement elements) experience the same relationships.

The Data have been collected from the Office for Students³ (OfS), and consist of the publicly published overall satisfaction rates for the 27 (or 22) questions, from 2010 to 2021. Nationally, programmes are grouped according to a common aggregation hierarchy (CAH).⁴ We are interested in the most finely defined hierarchy (CAH3), across a range of subjects.

We are observing the same subjects, within individual institutions over time, so we are observing a panel of institutions. The OfS

³ <https://www.officeforstudents.org.uk/advice-and-guidance/student-information-and-data/national-student-survey-nss/nss-data-provider-level/>, accessed 5/11/2021

⁴ <https://www.hesa.ac.uk/support/documentation/hecos/cah-list>, accessed 5/11/2021

will only publish results for a University if two criteria are met:

- i) A minimum of 10 students have replied and
- ii) A minimum of 50% of the cohort must have replied to the survey.

As such, there are a number of years where individual institutions are missing from the data. Table 2 shows the make-up of the panel across the two forms of the survey; for the range 2010 – 2016, between 39% (medicine) and 51% of institutions are missing at least one year of data. This, in part, reflects the increasing importance that has been placed upon the NSS, particularly with this feeding into the Teaching Excellence Framework since 2017.

To maximise data, we include all institutions with published NSS data. This leads to an unbalanced panel, but with relatively few institutions, this avoids losing institutions from our analyses non-randomly. Table 3 shows summary statistics relating to overall satisfaction and response rates. Overall satisfaction and response rates are lower within Economics than in either Physics or Medicine, but the within group variation is comparable across the three groups.

5.1. Estimating the relationship between overall satisfaction and individual characteristics

In analysing the relationship between stated satisfaction, we use a similar method to (Satterthwaite and Vahid Roudsari, 2020) and (Burgess, Senior et al. 2018). We are interested in the relationship between overall satisfaction and stated satisfaction relating to individual characteristics. As such we estimate:

$$\bar{O}_{j,t} = \beta_0 + \gamma \frac{m_{j,t}}{n_{j,t}} + \sum_c \beta_c \bar{S}_{c,t} + \mu_j + Year_t + u_{j,t}$$

Since halo effects, reputational effects, and effects related to infrastructure vary little across time, the University-fixed-effect, μ_j , will act to strip out any of the fixed components of $\bar{O}_{j,t}$ and $\bar{S}_{c,t}$, which will reduce the bias caused by omitted variables. In addition, since the demographic make-up of University cohorts only changes slowly, the fixed effects will also control for much of the demographic make-up of the student body. However, it is likely that there will still be some residual bias, due to institution-year shocks.⁵

The questions within the NSS are grouped into separate categories, with each category consisting of multiple questions. We are really interested in the relationship between the overall satisfaction and student satisfaction in a category. To analyse this, we could either take an average across the questions within each category,⁶ or we could use statistical methods to reduce the dimensionality. As we want to maximise the signal, whilst lowering the dimensionality, we use principal component analysis to identify the first principal component of each of the *categories* of questions, and then use the principal component in a principal component regression.

Spillover effects are likely to mean that, particularly within subsections of the NSS, satisfaction is likely to be very highly correlated, which is likely to lead to *imperfect multicollinearity*. To maximise the signal, whilst lowering the collinearity, we use principal component analysis to construct the first principal component of each of the *groups* of questions.

Year dummies are included to account for sector-based shocks which are likely to be determinants of response rates, satisfaction in individual questions, and overall satisfactions. For example, in 2017, in response to the possibility that NSS results would be (partly) used to enable institutions to increase, or maintain high, fees, the National Union of Students called for a *boycott* of the NSS. Similarly, the (worldwide) shock of COVID-19 is likely to have had an impact of reducing satisfaction across all measures.

6. Results

In this section, we discuss the inter-relatedness of individual NSS categories, and response rates with the overall satisfaction level; unlike previous research, we remove some of the endogeneity through the use of institutional fixed effects, although year-institution specific shocks may still exist, which could lead to residual endogeneity. Unlike previous research, we are interested in whether the interconnectedness of characteristics is homogenous across subjects, and whether the changes implemented in 2017 affected the link between categories within the NSS and overall satisfaction.

6.1. Response rates

We begin by examining the predictive power of response rates, and the determinants of response rates. Institutions have clear incentives to improve student satisfaction, both through the routes of improving their TEF award, and through the improved demand for students delivered by better league table performance. The rules of the NSS allow institutions to use incentives, such as prize draws, to incentivise participation, but not to incentivise particular responses. The most direct incentive is via a prize draw, administered by

⁵ For example, in 2019/20, a wide range of institutions experienced industrial action from the Universities and College Union. However, the response was insufficient to trigger a national strike, and so individual institutions were asymmetrically affected by strike action. Unfortunately, our data is not rich enough to be able to identify the effects of these strike actions on individual programmes, as union participation is not homogenous across subjects.

⁶ The NSS publishes average satisfaction across each category of questions. However, this loses some of the important emphasis and signal from that category.

Table 2
Panel characteristics.

2010–16	Economics	Medicine	Physics
Total number of institutions	79	35	44
Average number of times institutions are published (max 7)	5.941	6.093	5.846
Percentage published in each year	54.90%	61.34%	49.34%
2017 – 21			
Total number of institutions	93	40	55
Average number of times institutions are published (max 5)	4.69	4.63	4.62
Percentage published in each year	83.33%	77.14%	78.72%

Table 3
Summary Statistics.

		Economics		Medicine		Physics	
	Observations	796		361		445	
	Number of groups	94		38		53	
		Mean	SD	Mean	SD	Mean	SD
Overall satisfaction	Overall	0.835	0.093	0.867	0.100	0.883	0.083
	Between		0.082		0.072		0.094
	Within		0.071		0.070		0.063
Response Rates	Overall	0.686	0.092	0.751	0.095	0.725	0.091
	Between		0.075		0.068		0.070
	Within		0.070		0.072		0.070

Ipsos Mori, where all students who have completed the survey are eligible, although within institutions, incentives may be offered on the basis of response rates. If increasing (or decreasing) response rates have a significant impact on satisfaction, then providing incentives for students to complete (or not complete) the survey would be beneficial.

Fig. 1 illustrates the unconditional relationship between overall satisfaction and response rates for Economics, Physics and Medicine. Overall, this naïve relationship, suggests a positive, and significant, correlation between overall satisfaction and response rates. However, this ignores the possibility that response rates and overall satisfaction rates are being co-determined by (fixed) characteristics of the Universities.

We begin by estimating Eq. (4) below,

$$\bar{O}_{j,t} = \gamma_0 + \gamma_1 \frac{m_{j,t}}{n_{j,t}} + \mu_j + Year_t + u_{j,t} \quad (4)$$

where $\frac{m_{j,t}}{n_{j,t}}$ is the response rate in University j at time t , and $u_{j,t}$ is a random error term for university j at time t . Table 4 shows the results of these simple regressions for overall satisfaction; across all three subjects, within-group, the estimated effects suggest that an increase in response rates is associated with an increase in overall satisfaction, with a 10 ppt increase associated with between a 0.5 ppt (Physics) and a 1.56ppt (Economics) increase in overall satisfaction, although the relationship is only marginally significant for Physics and Medicine. We can also examine this deeper by considering whether the response rate effect seen in Economics is universal across institutions.

$$\bar{O}_{j,t} = \gamma_0 + \sum_j \gamma_j \frac{m_{j,t}}{n_{j,t}} + \mu_j + Year_t + u_{j,t} \quad (5)$$

To investigate this, we introduce an interaction term (Eq. 5) between the response rate and the institution. The estimated coefficients (along with 95% confidence intervals) are presented in Fig. 2. From the 86 institutions in Economics, the estimated sensitivity ranges from -2.45 to $+2.33$, but, 44 of the institutions have significant, *positive* effects. The overall results suggest that, at an institution level, year-on-year variations in response rates may be a good predictor of changes in overall satisfaction, but there is significant heterogeneity between both subjects and institutions.

However, whilst we can see that response rates have good predictive power for overall satisfaction, it is unlikely that these results are *causal*. $m_{j,t}$ is likely to be affected by characteristics of the cohort, which also co-determine $\bar{O}_{j,t}$.

$$\bar{O}_{j,t} = \beta_0 + \gamma \frac{m_{j,t}}{n_{j,t}} + \sum_c \beta_c \bar{S}_{c,t} + \mu_j + Year_t + u_{j,t} \quad (6)$$

We now move to evaluating the predictive power of individual elements of the National Student Survey on overall satisfaction.

Because the structure of the NSS changed in 2017, there is only an overlap of six questions which carried over directly into the 2017–2022 survey, with other questions either marginally re-worded (Q5, 2005–2016 “The criteria used in marking has been made clear in advance” was re-worded as “The criteria used in marking have been clear in advance”), removed entirely (Personal development was removed from the survey), and new questions have been introduced in 2017 (Learning opportunities, Learning community, and Student Voice). Due to the different structures of the underlying questions, we separately analyse the results from pre- and post- 2017.

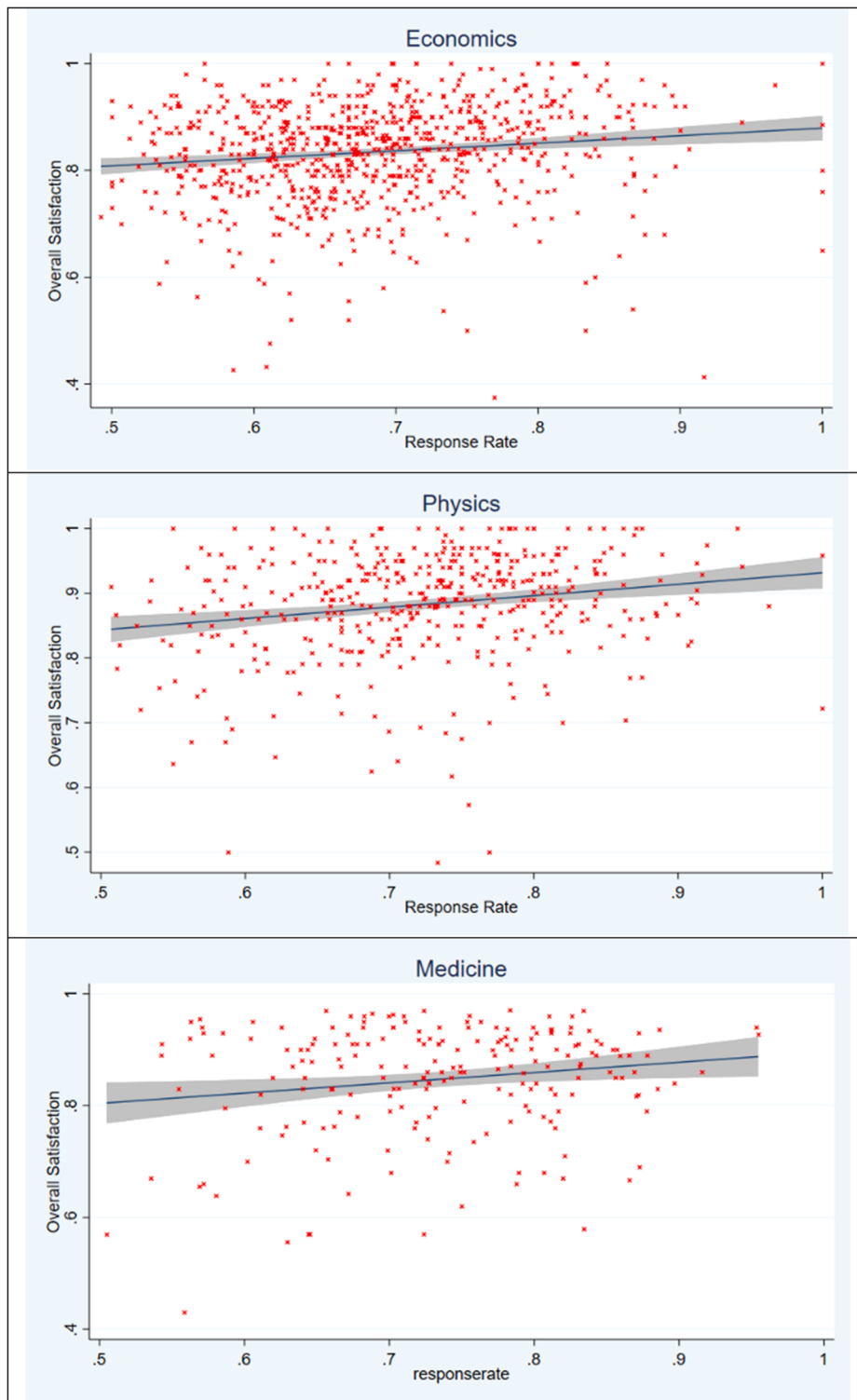


Fig. 1. Scatter plot of Overall Satisfaction against Response Rate.

Beginning with the analysis of 2010 – 2016, Table 5 illustrates the estimated relationships, within University, between overall satisfaction and individual questions, along with response rates. For all three subjects, the positive relationship between overall satisfaction and response rate vanishes. This indicates that the positive relationship demonstrated in Table 4 may be due to response rate being determined partly by measures of satisfaction, or that both response rates and satisfaction are co-determined by

Table 4
Predictive relation between overall satisfaction and response rate.

	Economics	Physics	Medicine
Response Rate	0.155*** (0.0433)	0.0552* (0.0326)	0.109* (0.0603)
Observations	796	445	361
R-squared	0.180	0.236	0.067
Number of Universities	94	53	38

Note: Dependent variable is the proportion of students who report satisfaction on Q27 (2017 – 2021), or Q22 (2010–2016). Robust standard errors, clustered at University level, in parentheses. University fixed effects, and year dummies included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

characteristics of the cohort.

Perhaps surprisingly, the relationship between overall satisfaction and the individual questions is heterogeneous across the subjects. The only question that provides similar (significant) predictive power across all three subjects is “The course is well organised and is running smoothly” with a 10ppt increase in satisfaction associated with a 2.92ppt, 1.61ppt and 1.49ppt increase in overall satisfaction across Economics, Physics, and Maths respectively.

Areas of “Teaching on my course” are important for both Economics and Physics, but somewhat surprisingly, whilst the point estimates are positive for medicine, only “The course is intellectually stimulating” is marginally significant. Similar heterogeneity is seen for “Assessment and Feedback”, with marking criteria particularly important in Medicine, but not in the other subjects. Elements of personal development also appear important for Physics and Medicine.

Because of spillover and halo effects, the estimated coefficients are likely to be imprecisely measure (due to collinearity). As such, we wish to maintain as much signal from the individual questions, but to avoid the collinearity, we use principal component analysis. Table 6 provides the results of the principal component analysis by subject and question group. In each group, we construct a new variable, based on the *first principal component*. We restrict ourselves to the first principal component in each, as these explain the majority of the variance, and all other components have relatively small eigenvalues.

Analysing the principal component regressions in Table 7 indicates that, for the 2010–2016 data, “Teaching on my course” and “Organisation and Management” are strong (positive) predictors of overall satisfaction of students. Academic support and personal development also provide consistent, positive coefficients, albeit with lower significance in Economics, than in Medicine or Physics.

Satisfaction with learning resources has little impact on satisfaction in Economics or medicine, but has a negative impact on satisfaction in physics.

We repeat this process with the 2017 – 2021 NSS results. Table 8 shows the initial fixed effects regressions for the 2017 – 21 data of overall satisfaction against satisfaction for each individual question. Important factors across all three subjects include “Staff are good at explaining things”, “The course is intellectually stimulating”, “The Course is well organised and running smoothly”, and again, response rates seem to have no significant impact on overall satisfaction. The opportunities to provide feedback also appear important in Economics and Medicine, but not in Physics. Further, in Medicine, learning opportunities, including “My course has provided me with opportunities to explore ideas or concepts in depth”, and “My course has provided me with opportunities to apply what I have learnt” appear important in determining overall satisfaction.

One worry with the 2017 – 2021 data is that a number of years were significantly affected by events that may have skewed the results. For example, in 2017, the National Union of Students organised a boycott of the NSS, in protest at the plan to link Teaching Excellence with the ability to raise fees. This led to twelve institutions failing to reach the 50% threshold for publication. (Grove, 2017). Similarly, the 2021 survey is likely to have been significantly impacted by COVID-19. As such, we use a robustness test to re-analyse the results for Economics, omitting 2017, 2021, and both years. Table 9 provides the results of these robustness checks, providing a comparison between all years (1), omitting 2017 (2), omitting 2021 (3) and omitting both 2017 and 2021 (4).

Comparing columns 1 and 2, there is little change in the estimated coefficients, suggesting that selection bias relating to the missing data from the 2017 strike causes little to no selection bias. Omitting 2021 leads to larger changes in the estimated coefficients, particularly related to learning community, and marking and assessment being fair.

In terms of having the right opportunities to work with other students, the substantial negative relationship when we omit 2021 with overall satisfaction is surprising. However, given that COVID-19 led to much more isolation between students, it should not be surprising that this question became less correlated with overall satisfaction during the COVID pandemic.

We repeated the principal component analysis for the 2017 – 2021 period, as shown in Table 10 and Table 11. For the 2017 – 2021 period, we again find that “Teaching on my course” is the strongest predictor of overall satisfaction across all three subjects. “Organisation and Management” remains a significant determinant in Economics and Physics, but is less important in medicine. Interestingly, the impact of “Assessment and Feedback” is inconsistent and appears to negatively impact overall satisfaction in both Economics and Medicine, whilst having a marginal positive impact in Physics.

As a robustness test, we repeat the analysis of Table 9 using PCA regressions, by omitting 2017 and 2021 from the specification of both the Principal Component Analysis, and the regression.

Table 12 focusses on PCA regressions in Economics, sequentially omitting 2017 or 2021. These omissions makes little difference to the headline results; Teaching on my Course, and Organisation and Management remain important determinants of overall satisfaction. Other components gain the same magnitude of estimates, albeit with some variation in statistical significance; for example,

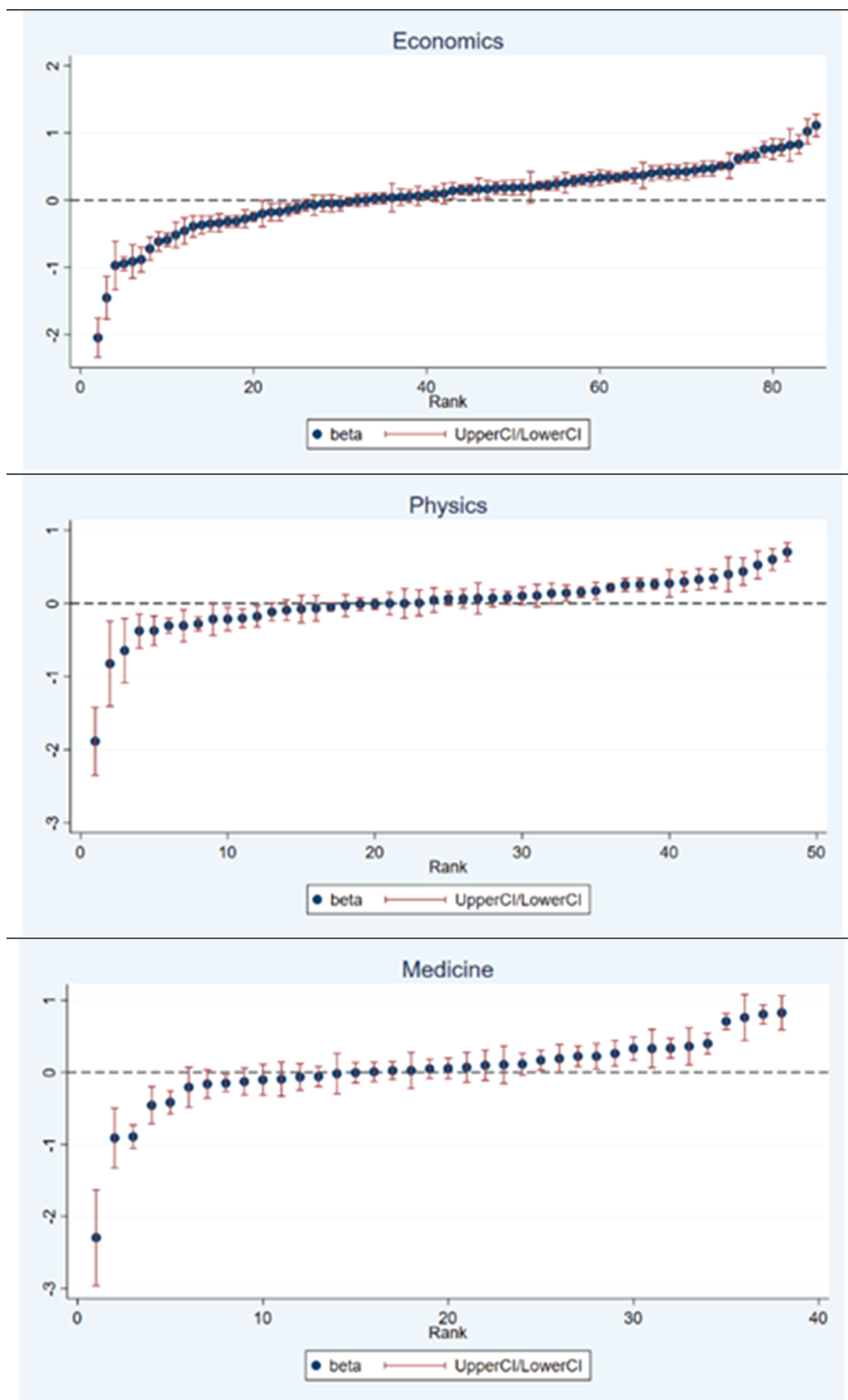


Fig. 2. 95% confidence interval plots of the heterogeneity of responsiveness of overall satisfaction to response rate. **Notes:** Confidence intervals constructed based upon robust standard errors, clustered at University level. In Economics, two observations have been removed, with estimated betas of -2.45 and $+2.33$. This is to aid clarity of the confidence interval plot.

Table 5
Responsiveness of overall satisfaction to individual sub-questions (2010 – 2016).

		(1)	(2)	(3)
		Economics	Physics	Medicine
Teaching on my course	Staff are good at explaining things	0.187*** (0.0595)	0.344*** (0.0559)	0.101 (0.0849)
	Staff have made the subject interesting	0.134** (0.0521)	0.00346 (0.0452)	0.0439 (0.103)
	Staff are enthusiastic about what they are teaching	-0.0301 (0.0479)	0.169*** (0.0609)	0.111 (0.115)
	The course is intellectually stimulating	0.0747 (0.0577)	0.165*** (0.0597)	0.210* (0.116)
Assessment and feedback	The criteria used in marking have been made clear in advance	-0.00492 (0.0467)	0.000927 (0.0355)	0.102** (0.0381)
	Assessment arrangements and marking have been fair	0.0600 (0.0466)	-0.0249 (0.0390)	0.0534 (0.0662)
	Feedback on my work has been prompt	0.00313 (0.0371)	-0.0491 (0.0334)	-0.00693 (0.0330)
	I have received detailed comments on my work	0.0364 (0.0468)	0.0624 (0.0485)	-0.106* (0.0595)
Academic Support	Feedback on my work has helped me clarify things I did not understand	0.00490 (0.0485)	-0.0287 (0.0425)	0.119 (0.0733)
	I have received sufficient advice and support with my studies	0.0287 (0.0522)	0.0639 (0.0487)	0.0524 (0.0767)
	I have been able to contact staff when I needed to	0.0505 (0.0626)	0.0765 (0.0616)	0.133** (0.0625)
	Good advice was available when I needed to make study choices	0.00768 (0.0485)	0.0822** (0.0372)	-0.0292 (0.0705)
Organisation and Management	The timetable works effectively as far as my activities are concerned	-0.0815 (0.0493)	0.0518* (0.0274)	0.0961 (0.0670)
	Any changes in the course or teaching have been communicated effectively	0.0928 (0.0648)	-0.0260 (0.0364)	-0.0510 (0.0521)
	The course is well organised and is running smoothly	0.292*** (0.0438)	0.161*** (0.0486)	0.149** (0.0614)
Learning resources	The library resources and services are good enough for my needs	0.0669 (0.0509)	-0.0705* (0.0413)	0.00953 (0.0626)
	I have been able to access general IT resources when I needed to	0.0337 (0.0661)	0.0162 (0.0440)	-0.0466 (0.103)
	I have been able to access specialised equipment, facilities, or rooms when I needed to	-0.0910 (0.0727)	-0.0544 (0.0435)	-0.0287 (0.0717)
Personal Development	The course has helped me to present myself with confidence	0.0658 (0.0524)	-0.0549 (0.0428)	0.0377 (0.0974)
	My communication skills have improved	0.0916 (0.0556)	0.0282 (0.0465)	-0.333** (0.153)
	As a result of the course, I feel confident in tackling unfamiliar problems	-0.0285 (0.0517)	0.214*** (0.0468)	0.501*** (0.0924)
	Response Rate	0.0137 (0.0398)	0.0545 (0.0353)	-0.0265 (0.0298)
Observations		408	227	193
R-squared		0.666	0.744	0.865
Number of Universities		79	44	34

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Learning community maintains the same magnitude of effect, but when 2017 is omitted, the estimated effect is less precisely estimated, and the effect becomes insignificant.

Finally, returning to response rates, we have seen that, once other characteristics are controlled for, response rates are generally not a good predictor of overall satisfaction. Having controlled for satisfaction in other questions, Economics demonstrated a small negative correlation between overall satisfaction and response rates, whilst for the other subjects, the overall effect appears negligible.

Table 13 shows the results of fixed effects regressions with the response rate for Q27 (Overall satisfaction) for 2017 – 2021. These results effectively provide conditional correlations between the overall response rate for Q27 and satisfaction in each individual characteristic. The results are produced using the same, first, principal component analysis as used in Table 11.

The results are very heterogeneous, and reflect the differences in student body between different subjects; in Economics, two key components help to predict overall response rate; increases in satisfaction with assessment and feedback are negatively associated with overall response rate, whilst organisation and management is a positive predictor of response rates. However, for physics and medicine, there is little conditional correlation with any of the groups of questions.

Table 6
PCA analysis 2010 –2016.

		Economics					Physics					Medicine				
Component		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Teaching on my course	Staff are good at explaining things	0.494	-0.471	0.661	0.311		0.523	-0.218	-0.515	-0.643		0.504	-0.397	0.761	0.093	
	Staff have made the subject interesting	0.526	-0.224	-0.176	-0.801		0.527	-0.335	-0.248	0.741		0.515	-0.193	-0.522	0.652	
	Staff are enthusiastic about what they are teaching	0.512	-0.088	-0.685	0.511		0.502	-0.209	0.820	-0.177		0.516	-0.202	-0.356	-0.753	
	The course is intellectually stimulating	0.466	0.849	0.249	0.014		0.443	0.892	-0.027	0.080		0.462	0.874	0.148	0.012	
	Eigenvalues	3.005	0.4543	0.3299	0.2104		2.811	0.560	0.385	0.245		3.349	0.369	0.153	0.129	
Assessment and feedback	Proportion	0.751	0.114	0.083	0.053		0.703	0.140	0.096	0.061		0.837	0.092	0.038	0.032	
	The criteria used in marking have been made clear in advance	0.403	0.700	-0.506	0.240	0.185	0.396	0.604	0.656	0.039	-0.217	0.430	0.500	0.722	-0.200	-0.059
	Assessment arrangements and marking have been fair	0.421	0.423	0.697	-0.376	-0.128	0.417	0.536	-0.639	0.120	0.341	0.416	0.604	-0.561	0.313	0.225
	Feedback on my work has been prompt	0.442	-0.277	0.312	0.790	-0.084	0.471	-0.211	-0.055	-0.854	-0.048	0.469	-0.205	-0.362	-0.764	-0.154
	I have received detailed comments on my work	0.481	-0.287	-0.394	-0.285	-0.670	0.462	-0.446	0.319	0.310	0.624	0.449	-0.494	0.182	0.181	0.699
Academic Support	Feedback on my work has helped me clarify things I did not understand	0.483	-0.414	-0.079	-0.310	0.702	0.484	-0.325	-0.237	0.399	-0.667	0.471	-0.315	0.022	0.495	-0.659
	Eigenvalues	3.363	0.618	0.482	0.397	0.139	3.236	0.831	0.423	0.336	0.174	4.003	0.656	0.177	0.119	0.045
	Proportion	0.673	0.124	0.096	0.080	0.028	0.647	0.166	0.085	0.067	0.035	0.801	0.131	0.035	0.024	0.009
	I have received sufficient advice and support with my studies	0.583	-0.523	0.622			0.605	-0.325	-0.727			0.580	-0.422	0.697		
	I have been able to contact staff when I needed to	0.546	0.819	0.176			0.527	0.848	0.060			0.572	0.820	0.021		
Organisation and Management	Good advice was available when I needed to make study choices	0.602	-0.237	-0.763			0.597	-0.419	0.684			0.580	-0.387	-0.717		
	Eigenvalues	2.353	0.434	0.213			2.134	0.566	0.301			2.828	0.112	0.060		
	Proportion	0.785	0.144	0.071			0.711	0.189	0.100			0.943	0.037	0.020		
	The timetable works effectively as far as my activities are concerned	0.545	0.820	0.178			0.497	0.867	0.038			0.573	0.764	0.298		
	Any changes in the course or teaching have been communicated effectively	0.603	-0.236	-0.762			0.617	-0.322	-0.718			0.583	-0.124	-0.803		
Learning resources	The course is well organised and is running smoothly	0.583	-0.522	0.622			0.610	-0.380	0.695			0.576	-0.634	0.516		
	Eigenvalues	2.260	0.478	0.262			2.021	0.666	0.312			2.740	0.156	0.103		
	Proportion	0.753	0.159	0.087			0.674	0.222	0.104			0.913	0.052	0.035		
	The library resources and services are good enough for my needs	0.566	0.805	0.180			0.549	0.819	0.167			0.572	-0.623	0.534		
	I have been able to access general IT resources when I needed to	0.579	-0.543	0.609			0.599	-0.246	-0.762			0.609	-0.114	-0.785		
Personal Development	I have been able to access specialised equipment, facilities, or rooms when I needed to	0.587	-0.240	-0.773			0.583	-0.518	0.626			0.550	0.774	0.314		
	Eigenvalues	2.403	0.343	0.254			2.055	0.552	0.393			2.137	0.538	0.325		
	Proportion	0.801	0.114	0.085			0.685	0.184	0.131			0.712	0.179	0.108		
	The course has helped me to present myself with confidence	0.584	-0.286	-0.760			0.619	-0.220	-0.754			0.579	-0.548	0.603		
	My communication skills have improved	0.579	-0.509	0.637			0.589	-0.504	0.631			0.562	0.804	0.192		
	As a result of the course, I feel confident in tackling unfamiliar problems	0.569	0.812	0.131			0.519	0.835	0.183			0.591	-0.228	-0.774		
	Eigenvalues	2.528	0.272	0.200			2.170	0.584	0.245			2.605	0.265	0.130		
	Proportion	0.843	0.091	0.067			0.724	0.195	0.082			0.868	0.088	0.043		

Table 7

Principal component regression for 2010–2016.

	Economics	Physics	Medicine
Teaching on my course	0.0166*** (0.00380)	0.0219*** (0.00245)	0.0118*** (0.00355)
Assessment and Feedback	0.00588* (0.00296)	-0.00268 (0.00203)	0.00923*** (0.00261)
Academic Support	0.00414 (0.00346)	0.0101*** (0.00288)	0.0131** (0.00500)
Organisation and Management	0.0147*** (0.00341)	0.00885*** (0.00224)	0.0172*** (0.00399)
Learning Resources	-0.00117 (0.00254)	-0.00447** (0.00179)	-0.00357 (0.00375)
Personal Development	0.00579* (0.00347)	0.00593** (0.00245)	0.00896** (0.00412)
Response Rate	-0.0140 (0.0403)	0.0500 (0.0380)	-0.0348 (0.0327)
Observations	408	227	193
R-squared	0.622	0.720	0.832
Number of Universities	79	44	34

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

7. Discussion

In this paper, we have used within institution analysis to estimate the determinants of overall satisfaction in the National Student Survey, focussing particularly on Economics, Physics and Medicine.

Our research builds upon (Burgess, Senior et al. 2018), (Langan and Harris, 2019), (Langan, Dunleavy et al. 2013), and we are able to examine changes in the relationship between overall satisfaction and the constituent elements between pre-2017, and post 2017, when the structure of the NSS changes, and to compare the effects across courses.

Many institutions provide incentives for students to complete the NSS, both through formal subscription to lotteries, managed by Ipsos Mori, where all students who complete the NSS are entered into a prize draw, or through informal mechanisms, such as social events, conditional on achieving particular response rates. Our most compelling results are that, whilst there is a substantial unconditional correlation between response rates and overall satisfaction, once other measures of satisfaction are controlled for, this relationship is reduced, and becomes insignificant.

Whilst there is likely to be some residual endogeneity, the results we have presented indicate that any positive relationship between response rates and overall satisfaction are likely to be the result of co-production, rather than a positive causal relationship, and the interplay appears to differ depending on what subject is being studied. For example, in Economics, we see a strong positive relationship between response rates and satisfaction relating to organisation and management; we have seen that organisation and management is a strong predictor of positive overall satisfaction, and so the unconditional correlation may simply represent the impact of organisation and management on overall satisfaction for Economics students. One key policy impact of this is that individual institutions should be discouraged from providing incentives to students for completing the survey, in part because response rates appear to have little **causal** impact on the satisfaction of students. Equally, incentives may inadvertently have the impact of influencing students' responses, leading to the survey results representing the quality of the incentive, rather than the quality of the education. Similarly, to pressurise students to complete the survey can possibly 'annoy' students to the point that the response might not be an objectives and thoughtful reflection on the actual learning experience.

For much of the life of the NSS, overall satisfaction (Question 27, or Question 22) was presented as a headline result, representing the overall quality of the programmes. However, we have consistently seen that overall satisfaction is influenced by “Teaching on my course” and “Organisation and Management”, although the influence of “Organisation and Management” may be weaker in clinical subjects such as medicine since 2017. The change for medicine appears to be being driven by students' response to the timetabling question, which changed in 2016 from “The timetable works effectively as far as my activities are concerned” to “The timetable works efficiently for me”. In the latter wording, this question is strongly and significantly negatively related with overall satisfaction, whilst prior to 2016, the point estimate was positive, but not statistically significant. However, for more classroom-based subjects (Economics and Physics), the impact of the timetabling question remains small, and largely insignificant.

We have demonstrated evidence that the determinants of overall satisfaction have remained very similar between pre-2017 and post-2017, and that there is heterogeneity across subjects.

Teaching on my course has remained a key determinant of satisfaction throughout the history of the NSS. However, an important observation is that the relationship has become stronger for both Economics and Medicine post-2017, whilst for Physics, there has been little change. Similarly, the impact of Organisation and Management has increased over time for Economics and Physics, whilst for medicine, the impact has reduced, and become insignificant.

Most surprisingly, the estimated relationship between overall satisfaction and assessment and feedback has become negative (and marginally significant) for both Economics and Medicine (which had previously seen marginally significant positive relationships),

Table 8
Relationship between overall satisfaction and constituent questions 2017–2021.

		Economics	Physics	Medicine
Teaching on my course	Staff are good at explaining things	0.309*** (0.0758)	0.220*** (0.0811)	0.237*** (0.0821)
	Staff have made the subject interesting	0.0343 (0.0654)	-0.0452 (0.0478)	-0.0276 (0.0832)
	The course is intellectually stimulating	0.385*** (0.0746)	0.234* (0.130)	0.284* (0.140)
	My course has challenged me to achieve my best work	0.0611 (0.0618)	0.0932 (0.0816)	0.195** (0.0931)
Learning opportunities	My course has provided me with opportunities to explore ideas or concepts in depth	0.0631 (0.0613)	0.145 (0.0981)	0.189** (0.0902)
	My course has provided me with opportunities to bring information and ideas together from different topics	0.0143 (0.0504)	-0.0602 (0.0554)	0.0215 (0.0824)
	My course has provided me with opportunities to apply what I have learnt	-0.0204 (0.0396)	0.000772 (0.0631)	0.235** (0.111)
Assessment and feedback	The criteria used in marking have been clear in advance	-0.149*** (0.0428)	-0.0797 (0.0540)	-0.0754 (0.0608)
	Marking and assessment has been fair	0.0513 (0.0491)	0.288*** (0.0749)	-0.0167 (0.0502)
	Feedback on my work has been timely	-0.0581 (0.0399)	-0.0383 (0.0458)	0.00632 (0.0323)
	I have received helpful comments on my work	0.0427 (0.0502)	-0.0360 (0.0648)	-0.119* (0.0676)
Academic Support	I have been able to contact staff when I needed to	-0.0131 (0.0666)	-0.106 (0.0946)	0.209*** (0.0698)
	I have received sufficient advice and guidance in relation to my course	0.0710 (0.0590)	-0.0501 (0.0650)	0.166** (0.0803)
	Good advice was available when I needed to make study choices on my course	0.0266 (0.0497)	0.0336 (0.0606)	-0.106 (0.0799)
Organisation and Management	The course is well organised and running smoothly	0.147*** (0.0472)	0.109* (0.0549)	0.168*** (0.0490)
	The timetable works efficiently for me	0.0618* (0.0365)	0.00718 (0.0625)	-0.162*** (0.0594)
	Any changes in the course or teaching have been communicated effectively	0.100 (0.0669)	0.0902 (0.0693)	0.0364 (0.0403)
Learning resources	The IT resources and facilities provided have supported my learning well	0.0921 (0.0575)	0.0454 (0.0905)	-0.145** (0.0631)
	The library resources (e.g. books, online services and learning spaces) have supported my learning well	-0.0219 (0.0712)	-0.165** (0.0806)	0.176** (0.0840)
	I have been able to access course-specific resources (e.g. equipment, facilities, software, collections) when I needed to	0.0635 (0.0455)	0.0566 (0.0922)	0.0663 (0.0888)
Learning Community	I feel part of a community of staff and students	-0.103** (0.0476)	0.0479 (0.0835)	0.0967* (0.0524)
	I have had the right opportunities to work with other students as part of my course	-0.0503 (0.0370)	0.190** (0.0731)	0.0858 (0.0731)
Student Voice	I have had the right opportunities to provide feedback on my course	0.135** (0.0513)	-0.0550 (0.103)	0.210*** (0.0720)
	Staff value students' views and opinions about the course	-0.0591 (0.0486)	0.133* (0.0739)	0.0274 (0.0652)
	It is clear how students' feedback on the course has been acted on	0.0875** (0.0380)	-0.00682 (0.0525)	0.0630* (0.0327)
	The students' union (association or guild) effectively represents students' academic interests	0.00719 (0.0301)	-0.0849** (0.0390)	-0.0391 (0.0464)
	Response Rate	-0.0482 (0.0295)	0.0483 (0.0447)	0.00682 (0.0264)
	Observations	388	218	168
	R-squared	0.810	0.719	0.928
	Number of Universities	91	52	38

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

whilst for physics, the overall effect remains consistent.

We have demonstrated that the overall satisfaction question is not simply an aggregate or average of the individual questions that underpin the NSS; based on the measured characteristics, students' overall satisfaction is largely influenced by “Teaching on my course” and “Organisation and Management”, and “Student Voice”. One way of interpreting this is that students placed high overall value on excellent teaching, and organisation and management, when assessing their own experiences of higher education, but placed much less weight on other (measured factors), such as assessment and feedback.

Table 9

Robustness Check by omitting years affected by large shocks. Economics only.

		(1) 2017–21	(2) Omitting 2017	(3) Omitting 2021	(4) Omitting both 2017 and 2021
Teaching on my course	Staff are good at explaining things	0.309*** (0.0758)	0.329*** (0.0841)	0.289*** (0.0806)	0.317*** (0.0879)
	Staff have made the subject interesting	0.0343 (0.0654)	0.0129 (0.0700)	0.0599 (0.0494)	0.0821* (0.0455)
	The course is intellectually stimulating	0.385*** (0.0746)	0.380*** (0.0879)	0.311*** (0.0600)	0.252*** (0.0771)
	My course has challenged me to achieve my best work	0.0611 (0.0618)	0.0637 (0.0825)	0.0615 (0.0537)	0.0486 (0.0632)
Learning opportunities	My course has provided me with opportunities to explore ideas or concepts in depth	0.0631 (0.0613)	0.0467 (0.0819)	0.0185 (0.0581)	-0.00734 (0.0726)
	My course has provided me with opportunities to bring information and ideas together from different topics	0.0143 (0.0504)	-0.0116 (0.0587)	0.0109 (0.0491)	0.0130 (0.0610)
	My course has provided me with opportunities to apply what I have learnt	-0.0204 (0.0396)	-0.0258 (0.0491)	0.0563 (0.0432)	0.0658 (0.0473)
Assessment and feedback	The criteria used in marking have been clear in advance	-0.149*** (0.0428)	-0.210*** (0.0468)	-0.109*** (0.0407)	-0.172*** (0.0616)
	Marking and assessment has been fair	0.0513 (0.0491)	0.119** (0.0490)	-0.000869 (0.0398)	0.0485 (0.0507)
	Feedback on my work has been timely	-0.0581 (0.0399)	-0.0398 (0.0465)	-0.0738* (0.0397)	-0.0618 (0.0483)
	I have received helpful comments on my work	0.0427 (0.0502)	0.0805 (0.0655)	0.0460 (0.0506)	0.111* (0.0612)
Academic Support	I have been able to contact staff when I needed to	-0.0131 (0.0666)	-0.00662 (0.0621)	0.0790 (0.0703)	0.0992 (0.0755)
	I have received sufficient advice and guidance in relation to my course	0.0710 (0.0590)	0.0789 (0.0656)	0.0780 (0.0613)	0.118* (0.0645)
	Good advice was available when I needed to make study choices on my course	0.0266 (0.0497)	0.0165 (0.0563)	0.0458 (0.0440)	0.0222 (0.0500)
Organisation and Management	The course is well organised and running smoothly	0.147*** (0.0472)	0.0832* (0.0495)	0.152*** (0.0409)	0.0851** (0.0419)
	The timetable works efficiently for me	0.0618* (0.0365)	0.0764** (0.0315)	0.0544 (0.0486)	0.0537 (0.0487)
	Any changes in the course or teaching have been communicated effectively	0.100 (0.0669)	0.123* (0.0689)	0.0779 (0.0522)	0.0586 (0.0479)
Learning resources	The IT resources and facilities provided have supported my learning well	0.0921 (0.0575)	0.123* (0.0670)	0.0159 (0.0490)	0.0132 (0.0604)
	The library resources (e.g. books, online services and learning spaces) have supported my learning well	-0.0219 (0.0712)	-0.0198 (0.0773)	0.0610 (0.0603)	0.0963 (0.0817)
	I have been able to access course-specific resources (e.g. equipment, facilities, software, collections) when I needed to	0.0635 (0.0455)	0.0346 (0.0505)	0.0242 (0.0420)	0.00166 (0.0541)
Learning Community	I feel part of a community of staff and students	-0.103** (0.0476)	-0.0799 (0.0509)	-0.0573 (0.0456)	-0.0514 (0.0492)
	I have had the right opportunities to work with other students as part of my course	-0.0503 (0.0370)	-0.0429 (0.0494)	-0.101*** (0.0382)	-0.112** (0.0484)
	I have had the right opportunities to provide feedback on my course	0.135** (0.0513)	0.113* (0.0660)	0.0409 (0.0465)	-0.00518 (0.0625)
Student Voice	Staff value students' views and opinions about the course	-0.0591 (0.0486)	-0.0586 (0.0588)	-0.0657 (0.0437)	-0.0500 (0.0579)
	It is clear how students' feedback on the course has been acted on	0.0875** (0.0380)	0.115** (0.0470)	0.128*** (0.0399)	0.170*** (0.0516)
	The students' union (association or guild) effectively represents students' academic interests	0.00719 (0.0301)	-0.0231 (0.0385)	0.0351 (0.0342)	0.00879 (0.0452)
	Response Rate	-0.0482 (0.0295)	-0.0156 (0.0393)	-0.0278 (0.0320)	0.0150 (0.0418)
	Observations	388	316	308	236
	R-squared	0.810	0.823	0.782	0.812
	Number of Universities	91	90	86	85

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In the most recent Teaching Excellence Framework, held in 2023, “Teaching on my course”, “Assessment and Feedback”, “Academic Support”, “Learning Resources” and “Student Voice” (Office for Students, 2022) were used as indicators of Teaching quality and Educational Environment (DfE, 2017). The evidence presented here is that, particularly based upon the 2017 – 2022 vintage of the NSS, feedback on Assessment and Feedback is not strongly related with other measures of student-evaluated quality (in particular

Table 10
Principal component analysis for 2017–2021.

	Component	Economics				Physics				Medicine			
		1	2	3	4	1	2	3	4	1	2	3	4
Teaching on my course	Staff are good at explaining things	0.511	-0.494	0.161	0.685	0.530	-0.295	0.424	-0.672	0.493	0.733	-0.010	0.469
	Staff have made the subject interesting	0.516	-0.443	0.093	-0.727	0.515	-0.537	0.041	0.667	0.511	0.036	-0.609	-0.606
	The course is intellectually stimulating	0.496	0.323	-0.805	0.052	0.454	0.774	0.364	0.249	0.498	-0.674	-0.145	0.526
	The course has challenged me to achieve my best work	0.476	0.675	0.564	-0.001	0.497	0.163	-0.828	-0.202	0.498	-0.088	0.780	-0.369
	Eigenvalues	2.962	0.484	0.342	0.212	2.612	0.635	0.476	0.277	3.154	0.370	0.318	0.158
	Proportion	0.741	0.121	0.085	0.053	0.653	0.159	0.119	0.069	0.789	0.092	0.079	0.040
Learning opportunities	My course has provided me with opportunities to explore ideas or concepts in depth	0.569	0.821	0.048		0.578	-0.554	0.599		0.598	-0.407	0.690	
	My course has provided me with opportunities to bring information and ideas together from different topics	0.581	-0.442	0.684		0.566	0.801	0.195		0.605	-0.335	-0.722	
	My course has provided me opportunities to apply what I have learnt	0.582	-0.361	-0.728		0.588	-0.226	-0.777		0.526	0.850	0.046	
	Eigenvalues	2.214	0.420	0.367		2.043	0.512	0.444		2.244	0.526	0.230	
	Proportion	0.738	0.140	0.122		0.681	0.171	0.148		0.748	0.175	0.077	
	The criteria used in marking have been made clear in advance	0.498	0.510	-0.518	0.474	0.512	0.314	-0.798	0.054	0.536	-0.313	-0.294	-0.727
Assessment and feedback	Marking and assessment has been fair	0.492	0.465	0.686	-0.268	0.486	0.650	0.575	0.105	0.474	-0.655	0.288	0.514
	Feedback on my work has been timely	0.488	-0.652	0.288	0.504	0.493	-0.584	0.129	0.632	0.483	0.533	0.679	-0.147
	I have received helpful comments on my work	0.521	-0.315	-0.423	-0.671	0.509	-0.371	0.129	-0.766	0.506	0.436	-0.608	0.430
	Eigenvalues	2.882	0.536	0.363	0.218	2.908	0.505	0.295	0.293	2.850	0.681	0.302	0.167
	Proportion	0.721	0.134	0.091	0.055	0.727	0.126	0.074	0.073	0.713	0.170	0.075	0.042
	I have been able to contact staff when I needed to	0.540	0.830	0.143		0.546	0.824	0.151		0.559	0.812	0.169	
Academic Support	I have received sufficient advice and guidance in relation to my course	0.604	-0.264	-0.752		0.600	-0.259	-0.757		0.592	-0.249	-0.767	
	Good advice was available when I needed to make study choices on my course	0.587	-0.492	0.643		0.584	-0.504	0.636		0.580	-0.529	0.620	
	Eigenvalues	2.286	0.478	0.236		2.185	0.502	0.312		2.655	0.253	0.092	
	Proportion	0.762	0.160	0.079		0.729	0.167	0.104		0.885	0.085	0.031	
	The course is well organised and running smoothly	0.611	-0.367	0.702		0.594	-0.452	0.665		0.588	-0.101	-0.803	
	The timetable works efficiently for me	0.500	0.866	0.017		0.524	0.845	0.106		0.570	0.756	0.322	
Organisation and Management	Any changes in the course or teaching have been communicated effectively	0.614	-0.341	-0.712		0.610	-0.286	-0.739		0.575	-0.646	0.502	
	Eigenvalues	2.040	0.653	0.306		2.084	0.594	0.322		2.706	0.196	0.097	
	Proportion	0.680	0.218	0.102		0.695	0.198	0.107		0.902	0.065	0.033	
	The IT resources and facilities provided have supported my learning well	0.578	-0.468	0.669		0.577	-0.595	0.560		0.578	-0.563	0.591	
	The library resources have supported my learning well	0.574	0.815	0.073		0.573	0.783	0.242		0.570	0.797	0.201	
	I have been able to access course-specific resources when I needed to	0.579	-0.342	-0.740		0.583	-0.181	-0.793		0.584	-0.221	-0.781	
Learning resources	Eigenvalues	2.405	0.309	0.286		2.204	0.416	0.380		2.372	0.344	0.284	
	Proportion	0.802	0.103	0.095		0.735	0.139	0.127		0.791	0.115	0.095	
	I feel part of a community of staff and students	0.707	0.707			0.707	0.707			0.707	0.707		
	I have had the right opportunities to work with other students as part of my course	0.707	-0.707			0.707	-0.707			0.707	-0.707		
	Eigenvalues	1.524	0.476			1.658	0.342						
	Proportion	0.762	0.238			0.829	0.171						
Student Voice	I have had the right opportunities to provide feedback on my course	0.483	-0.452	0.748	-0.058	0.506	-0.081	0.850	0.124	0.526	-0.237	0.779	0.244
	Staff value students' views and opinions about the course	0.542	-0.219	-0.429	0.688	0.576	-0.214	-0.254	-0.747	0.555	-0.159	-0.173	-0.798
	It is clear how students' feedback on the course has been acted upon	0.550	-0.034	-0.432	-0.714	0.555	-0.252	-0.450	0.653	0.538	-0.219	-0.602	0.549
	The students' union effectively represents students' academic interests	0.412	0.864	0.265	0.116	0.323	0.940	-0.105	0.016	0.354	0.933	0.027	0.055
	Eigenvalues	2.724	0.680	0.403	0.194	2.373	0.844	0.530	0.253				
	Proportion	0.681	0.170	0.101	0.049	0.593	0.211	0.133	0.063				

Table 11
Principal component regression 2017–2021.

	Economics	Physics	Medicine
Teaching on my course	0.0328*** (0.00388)	0.0232*** (0.00788)	0.0287*** (0.00482)
Learning opportunities	0.000446 (0.00352)	0.00154 (0.00784)	0.00562 (0.00539)
Assessment and feedback	-0.00538* (0.00321)	0.00981* (0.00535)	-0.0118** (0.00497)
Academic Support	0.00329 (0.00450)	-0.00131 (0.00529)	0.0140* (0.00758)
Organisation and Management	0.0209*** (0.00444)	0.0155*** (0.00541)	0.00683 (0.00556)
Learning resources	0.00687 (0.00414)	-0.00556 (0.00484)	-0.00257 (0.00418)
Learning Community	-0.0105* (0.00621)	0.0108 (0.00911)	0.00556 (0.00591)
Student Voice	0.00886** (0.00417)	-0.00530 (0.00668)	0.0227*** (0.00497)
Response Rate	-0.0534* (0.0314)	0.0636 (0.0493)	0.00919 (0.0306)
Observations	388	218	168
R-squared	0.768	0.593	0.890
Number of Universities	91	52	38

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 12
Robustness check for PCA regressions, omitting years with shocks.

	2017–2021	Omitting 2017	Omitting 2021	Omitting 2017 and 2021
Teaching on my course	0.0328*** (0.0039)	0.0326*** (0.0043)	0.0317*** (0.0035)	0.0336*** (0.0039)
Learning opportunities	0.0004 (0.0035)	-0.0015 (0.0038)	0.0032 (0.0044)	0.0014 (0.0048)
Assessment and feedback	-0.0054* (0.0032)	-0.0039 (0.0050)	-0.0067* (0.0036)	-0.0062 (0.0056)
Academic Support	0.0033 (0.0045)	0.0056 (0.0048)	0.0088* (0.0046)	0.0141*** (0.0049)
Organisation and Management	0.0209*** (0.0045)	0.0186*** (0.0057)	0.0168*** (0.0042)	0.0105** (0.0050)
Learning resources	0.0068 (0.0041)	0.0071 (0.0054)	0.0044 (0.0033)	0.0036 (0.0043)
Learning Community	-0.0105* (0.0062)	-0.0089 (0.0072)	-0.0109* (0.0055)	-0.0105 (0.0072)
Student Voice	0.0089** (0.0042)	0.0085 (0.0052)	0.0074** (0.0034)	0.0077* (0.0046)
Response Rate	-0.0534* (0.0314)	-0.0273 (0.0366)	-0.0479 (0.0373)	0.00583 (0.0454)
Observations	388	316	308	236
R-squared	0.768	0.772	0.741	0.757
Number of Universities	91	90	86	85

Notes: Dependent variable is the proportion of students who either “*Mostly agree*” or “*Definitely Agree*” with the statement “Overall, I am satisfied with the quality of the course”. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

overall satisfaction), and for Economics and Medicine at least, may be negatively related with overall perceptions of quality of the degree.

This result ties in with Buckley (2021), which indicates that there are a range of other predictors to satisfaction with assessment and feedback, including the achieved grade for students, meaning that this may not be an informative metric for informing the TEF, and could lead to unintended consequences, such as grade inflation. The use of academic support should also be considered, as the effects are heterogeneous across subjects, and the link between academic support and overall satisfaction is much weaker since 2017 than before.

The fact that there is such a weak relationship between overall satisfaction, and metrics such as “Assessment and Feedback”, along with the potential for unintended consequences suggests that caution should be taken when including NSS metrics within the Teaching Excellence Framework.

Table 13
Responsiveness of response rates.

	Economics	Physics	Medicine
Teaching on my course	0.00342 (0.00697)	-0.00277 (0.00556)	0.00196 (0.00944)
Learning opportunities	0.00114 (0.00622)	0.00751 (0.00703)	-0.00268 (0.0155)
Assessment and feedback	-0.0143*** (0.00480)	0.0176 (0.0121)	0.00959 (0.0115)
Academic Support	0.0110 (0.00699)	-0.00161 (0.0108)	-0.0100 (0.0133)
Organisation and Management	0.0192*** (0.00610)	-0.0174 (0.0117)	0.0238 (0.0156)
Learning resources	0.00125 (0.00446)	0.00210 (0.00801)	-0.00009 (0.00789)
Learning Community	0.00527 (0.00863)	-0.0147* (0.00857)	0.0126 (0.0127)
Student Voice	0.000885 (0.00653)	0.00662 (0.00879)	-0.00938 (0.0148)
Overall Satisfaction	-0.160* (0.0950)	0.158 (0.131)	0.0530 (0.176)
Observations	388	218	168
R-squared	0.161	0.108	0.134
Number of Universities	91	52	38

Notes: Dependent variable is the response rate for Q27 between 2017 and 2021. University level fixed effects are included, as are year dummies. Robust standard errors (clustered at University level) are included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Further, the overall satisfaction question is likely to be telling us more information about the overall quality of the degree than any of the individual, published metrics. Some of these factors are captured through other surveys (e.g. the graduate outcomes survey publishes employability outcomes), but others are not systematically captured. Whilst we may not know precisely what drives an institution towards high overall satisfaction, this provides an important signal to prospective students of the holistic nature of the undergraduate degree that they might study.

Interestingly, this paper and previous research findings do not seem to have played a major role in shaping the structure of the newly redesigned NSS questionnaire introduced in 2023. While the 'all-encompassing' overall satisfaction variable in England, the new questionnaire does not attempt to delve more deeply into the teaching features and, in particular, the organisation and management issues that seem to be of great relevance for students' satisfaction. The organisation and management section still includes only two questions that relate rather generally to organisation and communication that are unlikely to provide an opportunity to fully unpack the dimensions of organisation and management that are of concern for the students. Perhaps, the major change in the questionnaire is the change in the Likert-scale from a 5 to a 4-point scale aimed at 'inducing' students to 'declare' more sharply their satisfaction. Future research can focus on the validity of this new instrument in measuring actual satisfaction and on suggesting further, more refined, and focused approaches.

This suggests that when next revising the NSS, the Office for Students should consider whether to substantially increase the number of core questions, covering other aspects of student life, including careers, the built environment, social opportunities etc, or whether to reintroduce some measure of overall student satisfaction. An increase in the number of questions would likely lead to a reduction in overall completion, due to survey fatigue, but whilst it may be unpopular with institutions, some measure of overall satisfaction could provide a more holistic view of students' experiences at University.

More generally, perhaps there is a need to reflect more carefully on the actual scope and objective of the NSS. As currently designed, the survey resembles a checklist of 'tasks' that Universities are required to perform in the context of a 'value for money' narrative the higher education sector is subjected to. Perhaps, alongside the existing focus on employability within the TEF, the focus should shift towards measuring Universities' ability to develop graduates capable to grapple with and contribute to the socio-economic challenges facing the UK

In 2023, the overall satisfaction question has been removed from the NSS in England (although it remains for Wales, Scotland and Northern Ireland), and the Likert scale has been reduced from five options to four. This paper provides some insight for practitioners in Scotland, Wales, and Northern Ireland, and provides insight for practitioners in England to understand the determinants of overall satisfaction, whilst also providing comparability between the old and the new forms of the National Student Survey.

Credit Author Statement

Steven Proud and Guglielmo Volpe shared all elements of the authorship equally.

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Data availability

Data will be made available on request.

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