

# Student Information Use and Behaviour

An update to the 2014 Advisory Study for  
the Office for Students

CFE Research



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# Executive Summary

## About this study

In 2013, CFE Research was commissioned by the UK higher education funding bodies<sup>1</sup> to produce a literature review and advisory study about information behaviour as part of the *Review of information about learning and teaching and the student experience*. The Office for Students (OfS), which has replaced the Higher Education Funding Council for England, is now developing its approach to the provision of information, including investigating possible options for the replacement of the Unistats website.

Given the time elapsed since the previous CFE literature review it was considered essential to review, validate and update the findings to ensure a current evidence base, so the OfS commissioned an update to the work. This document summarises the key findings from this update, highlighting wherever possible the implications for providers of information to prospective higher education (HE) students.

## Key points

- Decision making about HE is challenging because the HE system is complex and there are lots of alternatives and attributes to consider; **providing information about HE is challenging because people are complex and because their needs, values and goals vary widely.**
- Those considering HE are making decisions in conditions of uncertainty. In these circumstances, **individuals tend to rely on convenient but flawed mental shortcuts** (heuristics) rather than on solely rational criteria. To date, little research has focused on these in HE.
- Simplification is needed to avoid information overload, but it can lead to extra weight being put on a particular attribute because it stands out compared to others which are less obvious or obscured. This highlights the **significant challenge to balance the accuracy of information with the need to make it engaging.**
- **There is no ‘one size fits all’ information solution**, nor is there a shortlist of criteria that those considering HE use. This drives the need for information to be tailored to individual cases, as the outcomes of student choice are inherently personal.

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<sup>1</sup> Department for Employment and Learning, Northern Ireland; Higher Education Funding Council for England; Higher Education Funding Council for Wales; and Scottish Funding Council

- One potential tool exists to support the aim of creating more personalised information: using two spectrums to represent the elements of **quantity** (maximisers to satisficers) and **type** (intrinsic to utility value) of information.
- **Data is not used by prospective students in isolation** and there is still reliance on prospectuses, family and friends, and university visits. This is because choosing to pursue HE, or a particular institution or course, sometimes comes down to whether the decision ‘feels right’.

## How people use information to make decisions

### We are not as rational as once thought

Traditional economic theory assumed that people make decisions in a rational way on the basis of having complete and accurate information, that individuals would make a full analysis of the costs as well as short- and long-term benefits of every decision. In contrast, Behavioural Economics and Social Psychology reveal how people actually behave and provide a more sophisticated account of information use. This evidence suggests that most decision making is not entirely rational, or is only partially rational. Emotional factors also influence decision making, although we do not yet know the full extent to which these factors work across different decision contexts, including HE.

### There are two systems of thinking which work in parallel

When attempting complex decision making or solving challenging problems, individuals rely on both ‘fast’ intuitive and unconscious thinking (System 1) as well as ‘slow’ analytical and conscious reasoning (System 2). Fast intuitive thinking is often an approximation. This creates a risk when individuals are faced with complex decisions and have limited resources, such as time. To avoid having to think too hard, which means engaging the conscious brain, people tend to simplify a decision problem so it can be solved with their fast intuitive thinking only. This does not mean that all information is avoided when a decision is complicated; rather there is a need to understand the role that information has in influencing the unconscious.

### We rely on mental shortcuts to make decision making easier

To simplify the decision making process we use many different mental shortcuts called ‘heuristics’ which reduce mental effort. Furthermore, we succumb to biases (a tendency to favour or un-favour a particular idea). Researchers have identified over 175 biases that influence us. Further research is needed to understand which play a role in HE decision making.

### Information seeking behaviour is unique to each individual

Individuals approach information seeking differently and broadly speaking these can be categorised in three ways. They include: ‘maximisers’ who seek the maximum amount of information and try to evaluate all potential options; ‘satisficers’ who

make a decision or take action once their criteria are met; and ‘pragmatisers’ who might be willing to modify their goals in response to constraints and limitations and usually settle on one or two ‘safe’ options that they would be happy to accept.

## **The key aspects of information behaviour in HE**

### **Decisions about entering HE are different to any other life decision**

Decision making about HE is challenging because the HE system is complex and there are lots of alternatives and attributes to consider. The provision of information about HE is challenging because needs, values and goals vary widely. With both short- and longer-term costs/benefits to trade-off, it is a fairly unique decision, where there is a spectrum of intrinsic vs. utility value which varies from individual to individual, and can vary for an individual within their decision making journey. It explains why there is little available evidence on information behaviour and decision making which is directly applicable to the HE context, and knowledge gaps continue to exist in this area.

### **Information needs of prospective students vary**

There is no single factor or shortlist of factors that all prospective students consider; nor therefore a list of information requirements. It might seem like an unremarkable observation, but the prospective student market is therefore a segmented one, and information requirements need to be considered by prospective student *types*. Evidence suggests that special consideration must be given to the information needs of particular groups of prospective students who experience difficulty in course choice and decision making, such as black and minority ethnic (BAME) groups, students without higher education experience in their families and learners with special educational needs (SEN). Although it can be difficult to provide, information on the costs of HE and practical considerations such as travel and accommodation is particularly valued by mature and part-time students and prospective students from families with no prior HE experience.

### **The quality of information is more important than quantity**

There are limits to the amount of information-processing that people can undertake. It is challenging to identify the point at which the amount becomes too much, made more difficult by the fact that people have different abilities and preferences for information-processing and because the difficulty of decision making will also vary. The impact of this is to acknowledge that more information is not necessarily the answer when aiming to support individuals in making the best decision for them. Providers of HE information also need to be aware of the complex and dynamic nature of prospective students’ information seeking. In situations where there is potential for an individual to be overwhelmed there is a need for practical and reliable ways of reducing the information-processing task – for example, through

infographics and data visualisation – whilst being aware of the potential for this simplification to mislead users.

### **Decision makers' preferences are fluid and not stable**

The preferences of prospective HE students are not fully formed as they seek information. They are influenced by a wide variety of both personal traits and by their social and institutional environments. When researching HE decision making, and asking individuals about the information they used and decisions that they made, the explanations they provide are likely to differ from their actual decision making processes, as humans are not very reliable informants about why they adopted certain information search behaviours or made certain choices. This impacts on the reliability of research into HE decision making, which relies on survey responses or direct questions.

### **How HE study is valued is important**

Evidence suggests that both 'expectancy' (students' beliefs concerning the degree to which they are confident in accomplishing an academic task) and 'task value' (the degree to which they believe that the academic task is worth pursuing) are important in predicting HE course choice. Task value can also comprise both 'intrinsic' value (enjoyment of the student experience) and 'utility' value (perceived future usefulness of what is being learnt). Research has revealed that prospective students can be encouraged to perceive utility value in courses. One 'information initiative' of this type positively affected course selection and improved take-up of potentially more financially rewarding courses. However, messages conveyed can be processed differently, leading to different outcomes from interventions based on prospective students' socio-economic status.

### **Level of trust in the messenger matters**

Information's value depends on context, timing and the level of trust between the information provider and user. The varying perceptions of trust have been described as 'hot', 'cold' and 'warm' information. Prospective students perceive other students, friends and family as offering access to reliable information, or as providers of hot information. Given prospective students' preference for information provided by known sources, it is easy to assume that social media could play an influential role in decision making. However, whilst social media use is universal amongst 16-24 year olds, and two thirds of the adult population use it weekly, there is little robust evidence of its role or impact in HE decision making. According to some research, social media is the least likely source of HE information to be trusted.

### **Data about HE provided in isolation is not enough**

Younger HE applicants are more likely to use university visits and to regard these as the most useful information source. A CFE survey of 16-19 year olds found they consulted, on average, with three individuals (e.g. parents/carers, teachers, friends)



and two resources (e.g. UCAS and individual provider websites). Therefore, data provision alone is insufficient, as prospective students who access and use data are unlikely to do so in isolation. Even information that is provided free online may be too difficult or costly for some to access, so where possible support needs to be carefully tailored and included when providing information.

### **Younger decision makers are more influenced by norms and peers**

New evidence suggests that most applicants to HE are well within the age band that is most capable of processing complex information. However, adolescents demonstrate adult levels of cognitive capability earlier than they develop emotional and social maturity. The consequence is that although they are capable of processing complex information to inform their decision making, their lesser emotional and social maturity means that they are more likely than adults to default to social norms or to let friends and peers influence their decision making. Therefore, efforts also need to be directed at counterbalancing peer influence and social norms, such as providing role models and making counter stereotypes available, i.e. for BAME students.

## **Implications for HE information provision**

- **Do not assume that more information means better informed.** There is a limit to the amount of information decision makers can process. This challenges the assumption that ‘more information or data will lead to more informed’ prospective students. Only the right information for that person will lead to a more satisfactory outcome for that individual.
- **The type of information matters.** For example, employment outcome data is useful in persuading prospective students about the perceived future use (utility value) of pursuing academic study. But it tells us little about the likely enjoyment of study (intrinsic value) or confidence in ability (expectancy value) which can play an equal or greater role in the decision for some individuals. Prospective students need different types of information to meet their varied information needs.
- **Tailoring information provision is important.** There is no single set of criteria used by prospective students, therefore there is no single solution of the ‘right’ information. Those providing information need to ascertain which type of individual they are working with and tailor their response accordingly, or cater for all types of information user where engagement is not at an individual level.

- **Information strategies should be broader than just the provision of data.** Information providers need to support decision making and encourage individuals to be more reflexive and empowered. This might involve encouraging dialogue, so that they are prompted to challenge any habits that they might default to as a result of any peer influences or cultural norms.
- **When simplifying information be careful not to be misleading.** Increased amounts of data creates challenges in how to present caveats or limitations. The onus is on data providers to ensure that data is presented in a responsible way to minimise misinterpretation or unduly increase the focus on a particular attribute.
- **Introduce grading systems with caution.** There is evidence to suggest that grading systems may have unintended effects for certain sub-groups of prospective students. In addition, grading systems may not be ideal in helping prospective students to make optimal decisions on the basis of multiple criteria. Where they focus on one aspect they may lead decision makers to trade off other aspects, particularly those not graded comparably.
- **Proceed with caution when disseminating information about HE via social media.** Social media certainly provides a space for prospective students to share and source information. Nevertheless, little is known about how interactions influence decisions and current evidence suggests low levels of trust in these channels for HE information.

# 1. Introduction

## 1.0 Aims of this Study

In 2013 the UK higher education funding bodies commissioned CFE Research to produce a literature review on the provision of information about higher education (HE), as part of its wider review of information about learning and teaching and the student experience. That literature review, published in 2014, is hereafter referred to as the Advisory Study.<sup>2</sup> Following a consultation on proposals arising from the review, in 2015 the UK funding bodies made changes to the data collected for publication on the Unistats website and stated their intention to develop a new resource to replace Unistats, in light of the evidence gathered, to better reflect diverse student information needs and to better support student decision making.<sup>3</sup>

The Office for Students (OfS) is currently developing its strategy around the provision of information, including working with the UK funding bodies to consider options for the future of Unistats and whether a replacement should be developed. Given the time elapsed since the Advisory Study, the OfS has identified the need to review, validate and update its findings. This will ensure that there is a rigorous and current evidence base on information use and behaviour in higher education to inform the OfS's strategy for information, advice and guidance (IAG).

CFE Research has been commissioned by the OfS to update the Advisory Study to ensure that it reflects the latest research about decision making and information behaviour. The purpose of this update is to check that the conclusions in the original Advisory Study report still hold. We have updated the findings and principles to reflect more recent or better evidence. We draw out the implications of this evidence for decision making about what and where to study. We identify where recent changes in technology, communications and behaviour are impacting the ways in which people access and process information about higher education.

## 1.1 Key Findings from the Original Advisory Study

The most important message from the Advisory Study is that the information needs of prospective students are as varied as their behaviour in addressing those needs. This means that there is no definitive set of information nor is there a single way of presenting it that can address such diverse needs.

Activity relating to the acquisition and use of information is called information behaviour. Information behaviour is influenced by: personal and psychological characteristics; social relations; and environmental factors. For example, personal characteristics in the form of psychological or behavioural traits may inhibit

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<sup>2</sup> <http://www.hefce.ac.uk/pubs/rereports/year/2014/infoadvisory/>

<sup>3</sup> <http://www.hefce.ac.uk/lt/roiconsult/about/>

information seeking; social pressure, e.g. from peers, may reduce opportunities for gathering and evaluating information; environmental factors, such as proximity to home, also constrain choices and decisions.

In contrast with the underlying assumptions of the traditional economic approach to decision making, people do not always act rationally and selfishly in their own long-term best interests and do not have an unlimited capacity for information-processing. Behavioural economics is founded on this idea of 'bounded rationality' and offers more nuanced theories to account for human behaviour. Amongst the most important implication for the provision of information is that *more information is not always better*.

Studies in behavioural economics offer theories to explain why people's behaviour can deviate from rationality. In conditions of uncertainty, people may resort to quick 'heuristics' (rules-of-thumb for ready reckoning) instead of slower and more deliberate calculation. This is one of the ways in which behaviour deviates from rationality. Processing information incurs a cost in terms of cognitive load. When this becomes too much, people suffer *information overload*; beyond this point they are more likely to use heuristics that impair their judgements.

Biases also occur in situations of uncertainty. Decision making about higher education (HE) involves judgement under uncertainty because HE is a 'post-experience good' whose value cannot be determined even after the experience itself. A degree has many dimensions of value – economic, cultural and social – and their relative importance varies with each individual. To take just one example, evaluating job prospects is also uncertain because future labour market conditions are unknown. For these reasons, no matter what type or quantity of information is available to prospective applicants, *decision making about HE will always involve some uncertainty*.

Broadly speaking, people occupy a place on the spectrum of behaviour between 'maximisers' and 'satisficers'. Maximisers have insatiable needs for information, whereas satisficers are satisfied when they feel they have enough to make a decision. *Information providers should therefore take account of widely varying needs for information*.

Approaches to information processing have been characterised in terms of two hypothetical thought systems: 'System 1' is automatic and fast but can be inaccurate; 'System 2' is slower and controlled, generally leading to more accurate results but at the cost of time (Kahneman, 2011). Yet 'thinking fast' isn't always fallible. Experts can quickly evaluate situations they are trained to deal with (e.g. a grandmaster assessing the position of pieces on a chess board). Furthermore, other non-specialist kinds of judgement can be automatic but accurate. For example, visual perception can instantaneously judge relative size, and hearing can immediately distinguish notes at two different pitches. Because of this, *data visualisation can offer a way to process quantitative information that not only incurs less cognitive load than processing tables of numbers, but also offers the benefit of more reliable judgement*.

Varying attitudes and reactions among different groups mean that they require information to be presented in different ways. People use a variety of sources to fulfil their information-seeking requirements, and they employ a variety of methods to reduce the complexity and uncertainty involved. Decision making is a very personal activity and HE information providers should work towards tailoring information provision to individual cases. This means that *there is no single solution for the provision of the 'right' information.*

## 1.2 Method

This review adopted a rapid evidence assessment (REA) approach, necessitated by the limitations of timescales and budget. Compared with a systematic literature review, the REA approach sacrifices some level of rigour in the searching and review stages. By using focused search parameters and limiting the searches and databases used, the search process is accelerated to deliver robust results within time and resource constraints. Because the aim is to validate and update findings from the 2014 report, the purpose of this review is to consider a wide range of ideas, rather than gathering *all* available evidence or mapping the field. The review comprised the following stages:

- **Search** of academic and 'grey' (publicly available) literature to build a database of potentially useful sources. The list of terms used in the Advisory Study was reviewed and revised for use in this review. The main search parameters were to include new evidence published since the Advisory Study, i.e. within the last five years. The full list of search terms is included in Appendix 1.
- **Selection** of material based on rapid evaluation of relevance from titles and abstracts.
- **Review** using the annotated bibliography method. The approach and key findings were noted for each source along with potentially useful quotations.
- **Analysis** through an in-depth review of the material to understand the findings, identify corroborations/inconsistencies and clarify implications.
- **Synthesis** of findings and write up.

## 1.3 Literature Analysis

For comparability, this analysis follows the same procedure as the 2014 Advisory Study. In the reviewing stage, each source of evidence (article, report, etc.) is classified according to the following bibliographic details:

- Author

- Year of publication<sup>4</sup>
- Title
- Abstract
- Categorisation by key search terms (outlining in which categories of interest the research document relates to)
- Theme (a short heading on the broad topic of investigation within each document)
- Methodology (an outline of the key methodological points)
- Methodology score (out of three, one being the best)
- Key findings and outcomes of the research (an analysis of the key research findings, any useful outcomes and any potential learning that is useful for our project)
- Relevance to the research project (whether the topic and findings of the document are relevant to our aims, A being most relevant and C being least relevant). This system is used to prioritise a more in-depth evaluation of source material. Relevance ratings were based on subjective judgements, and are used to focus resources on the evidence that is most likely to be useful: we first reviewed material rated A before reviewing B and C.
- Inclusion/exclusion decision (whether the document should be incorporated into our final report – a yes or no).

These details are incorporated into a framework for analysis. The charts below (Figures 1 to 3) represent the main results of the literature analysis, based on the categorisation process described above. These charts represent analysis of the 182 articles and reports included in the literature review (not all of which are cited in the current report). Online data sources and websites are excluded from this analysis. Some sources from the Advisory Study are cited in this report; these are not included in the analysis below.

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<sup>4</sup> The initial remit of this review was to comprise only material published in the last five years (i.e. since the publication of the Advisory Study in 2014), but other sources have been included where relevant.

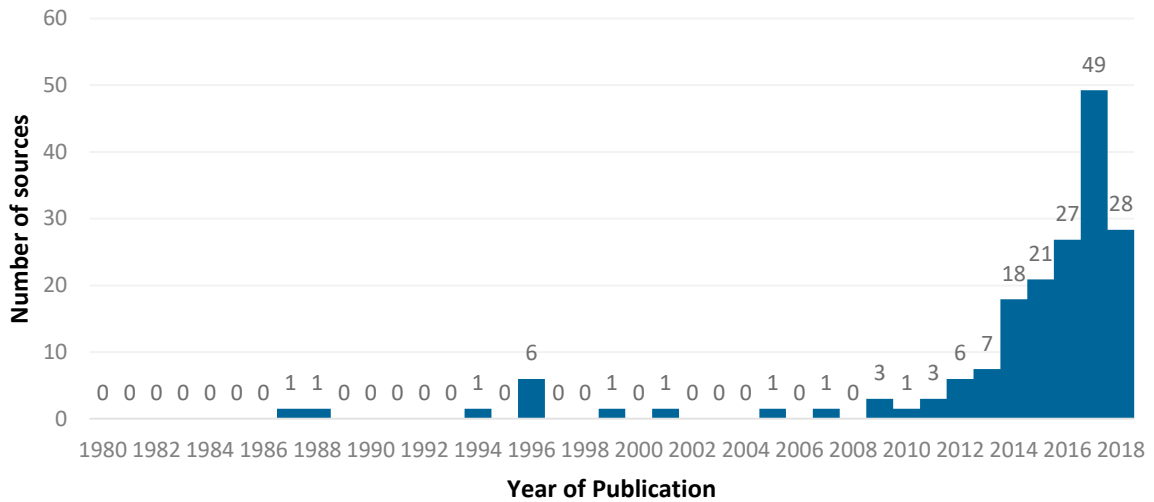


Figure 1: Date of source material, by year of publication

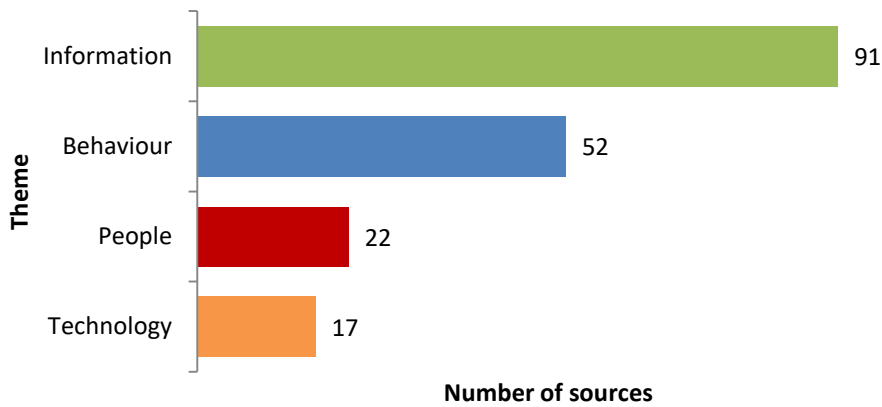


Figure 2: Distribution of source material by broad themes (number of sources per theme)

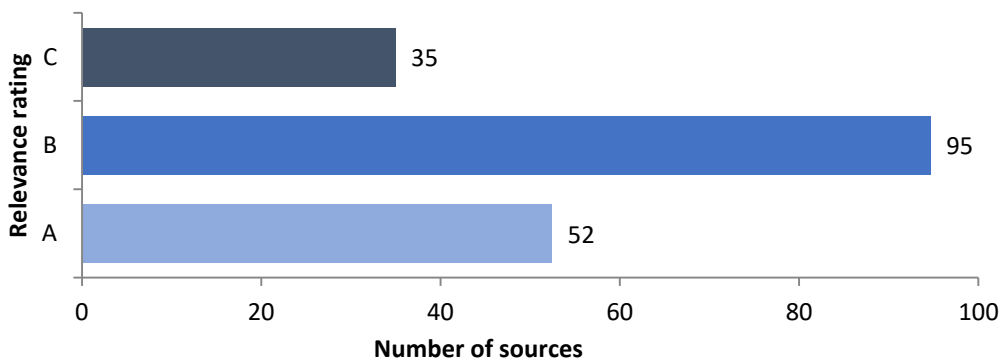


Figure 3: Relevance rating of literature sources (number of sources per rating)

## 2. Understanding Information

### 2.0 Chapter Overview

In the Advisory Study we discussed how the topic of information is explored through several disciplines and applied in diverse ways. To provide a foundation for the previous report, we examined literature that could help to clarify what information is and how it is used within the context of HE. This revealed that a wide range of fields can inform the subject of information about HE. We identified information theory as crucial in laying the foundations of our understanding of information, but we also suggested that it was insufficient to explain how people engage with information. To understand information behaviour we can draw on insights from behavioural and psychological studies. Information science, economics, psychology and sociology provide useful sources of evidence to help us to understand the internal and external aspects of information behaviour. In the present review we revisit these fields of study to identify any new insights that could contribute to understanding of information use in HE decision making.

This chapter explores whether or not there have been any developments in the field of information theory, and how they might affect our understanding of the HE decision making process. The later chapters explore wider influences on information behaviour that can be categorised into: behavioural (dealt with in Chapter 3), and social and environmental (Chapter 4).

### 2.1 An Introduction to Information

Our Advisory Study took a brief look at some of the ways in which the understanding of information has developed to provide a theoretical framework for our study. It both identified fields of study and considered the terminology commonly used to describe information and information use. The underpinning theory that we drew upon in that prior study has stood the test of time and there is little now to add to update the theoretical foundations set out previously.

In the following paragraphs, the fields of study are highlighted in **bold text** and key terms are highlighted by underlining.

#### 2.1.0 Conceptualising and Measuring Information

The foundation for information theory was laid by Claude Shannon (1948). He is widely described as the founder of the science of **information theory**, a set of ideas that led to the creation of the Internet, digital communications and telecommunications. Since our previous study there have been academic publications that further the application of Shannon's concept of information, particularly in the context of machine learning and artificial intelligence. However their relevance to the study of decision making in the context of HE is minimal, so we do not delve into such evidence here.



### 2.1.1. The Limitations of Information Theory

Despite the significance of Shannon's work, information theory is a restrictive approach for understanding how people use information. In considering the use of information in decision making about HE, we therefore focus our attention instead on information science and the range of activities relating to the acquisition and use of information: information behaviour.

## 2.2 Information and the Social Sciences

### 2.2.0 Information Science

**Information science** is a broad interdisciplinary field that incorporates knowledge management, computer science, library systems and the social sciences. This field aims to understand the range of activities relating to acquiring and using information, referring to these activities as information behaviour. Information science is a fragmented field of study that brings diverse approaches together, not all of which can be classed as scientific. Yet this is a fruitful area for this update to the Advisory Study because it provides models of decision making that describe or explain how observed information behaviour addresses information needs through information seeking.

### 2.2.1 Information Behaviour

Information behaviour can be understood through a variety of approaches, and is closely related to studies of decision making. One can either consider research into decision making as a part of information science or as a discrete subject in itself, since the two subjects are closely intertwined but also clearly separable. In this update, we draw on evidence from information science but also draw on research outside of this field where findings can usefully inform HE decision making.

In the Advisory Study, we described how the traditional model of decision making is rational choice theory. This offered a framework for understanding social and economic behaviour regarding decision making, yet when we conducted our earlier review rational choice theory had begun to be questioned and it has since come under even greater scrutiny. It had been ubiquitous in psychology and social sciences, but “the rationality assumptions that appear to be central to so much psychological explanation appear to stand up poorly to rigorous experimental scrutiny” (Vlaev, 2018). Information research had previously relied heavily on ‘rational choice theory’ and the assumption that “effective decision making is preceded by and inextricably linked to the seeking and use of information to make reflective, evidence-based decisions” (Mishra et al., 2015). Jennifer Berryman (2008) was one of the first information behaviour researchers to have identified that new developments in decision science pointed to ‘naturalistic decision making (NDM) as an alternative model’. Yet there has since been very little take up of the NDM in research and analysis, apart from a small number of studies in the health sector. Interestingly, though, one of these studies noted that when information was absent

participants 'satisficed'. This means that they went ahead to make a decision, despite being aware that they did not have all of the information that they knew they needed.

So whilst information behaviour studies have tended to focus on rational models, research into decision making has explored possible alternatives. Recent research into decision making has also considered the relationship between a rational model and its alternatives, which has been described as the dual processing debate. Many questions remain regarding what drives individuals' decision making despite attempts that have been made to label these two modes of thinking.

In Chapter 3 we discuss the work of Kahneman and updates to the way in which his work conceptualised these two different ways of thinking, which he describes as System 1 (non-rational) and System 2 (rational). Other labels that have been given to these two modes of thinking are: experiential vs. rational, intuitive vs. deliberative, reflexive vs. reflective, and intuitive vs. analytic (Mishra et al., 2015).

The rational mode of thinking is conceptualised as "a formal process that is conscious and sequential and involves analysis before reaching a decision".<sup>5</sup> The theory associated with this model of decision making assumes that the optimal decision will ultimately be chosen on the basis of the available information. There are however factors that prohibit this, including most notably 'bounded rationality'. This means that individuals do not always actively seek out all of the information that they require to make their decisions. Indeed current evidence has been starting to filter through to suggest that people opt to 'satisfice' rather than always attempting to optimise their decision making. In the alternative model, information is processed in a nonconscious way. Tacit, 'gut feeling' or nonconscious cues are called upon and decision making follows a non-obvious pattern. In this model, options are not analysed consciously.

Many career theorists rejected rational choice theory some time ago. For example, CFE's prior research for the Department for Education (DfE) into Post-16 Choices (CFE Research & Hughes, 2017) summarised the significant body of academic literature that has examined young people's styles, processes and strategies in relation to career decision making. In particular this study cites the work of Harren (1979) who identified three decision making styles: rational, avoidant and dependent. The rational decision making style is often viewed as a systematic approach that yields information relevant to supporting decisions. However our review of the literature for the Post-16 Choices study found no conclusive evidence that the rational style is associated with superior decision making outcomes, nor any evidence that this is common behaviour. Consequently many questions remain

regarding what drives individuals' decision making, despite attempts that have been made to label decision making styles and modes of thinking.

## 2.3 Key Findings

While there has been further research in the field of information theory, there has not been any significant development that would alter the previous conclusions. The application of insights from psychology and behavioural economics continue to grow in importance for understanding the provision of information about HE. This is because of changes in the HE landscape such as political reforms which increasingly drive the idea of 'student as consumer',<sup>6</sup> for example the application of consumer protection laws to HE students and the guidance offered to undergraduate students by the Competition and Markets Authority (CMA, 2015).

Wilson's (1997) general model of information-seeking behaviour recognises that decision making is influenced by three categories: personal, social and environmental. His model demonstrates the inter-relationship of these spheres of influence, and forms the basis for the structure of both the original and the present report to cover the fields of study that have the potential to inform understanding of information use relating to HE decision making. Since 2014, several hundred papers have been published which cite Wilson's model and while there is more empirical work there is no change to the fundamental theory. The model has been applied and adapted in a number of contexts, including extending the theory to account for the context of distance learning (Tury et al., 2015) but it remains a "general theory of information behaviour" (Wilson, 2016).

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<sup>6</sup> <https://www.officeforstudents.org.uk/advice-and-guidance/regulation/student-protection/students-as-consumers/>

# 3. Understanding Information Behaviour

## 3.0 Chapter Overview

Theories of human behaviour derived from the traditional economic approach to decision making are based on assumptions about why people act as they do. These assumptions suggest people behave rationally in their own long-term best interests on the basis of having complete and accurate information, which allows for a full analysis of the costs and benefits of different choices. In contrast, the Advisory Study introduced a series of approaches to economic understanding that had been developed based on evidence of how people actually behave, and had come to the attention of policy makers in recent years. It suggested that evidence from behavioural studies had started to build on traditional economic assumptions to provide a more sophisticated account of behaviour.

The Advisory Study report explained how this field of **behavioural economics**, which was increasing in popularity in 2014 but which is now more established, is characterised by theories of why people frequently behave in ways that would be described as ‘non-rational’ in terms of traditional economic understanding. It outlined how, in contrast to traditional economic theory, the ways in which people’s behaviours deviate from rationality are not random, but conform to predictable patterns. Non-rational behaviour usually leads to more errors than fully rational analysis, but it is often wrong in predictable ways. This allows behavioural economists to formulate principles that account for observations of behaviour that deviate from rationality and which therefore can potentially provide a more nuanced description of observed behaviour. Our report found that for providers of information about HE, understanding behavioural principles may offer a route to enable a more informed and reflexive approach to student decision making.

This chapter revisits the concepts of behavioural economics and its usefulness in understanding information behaviour. It considers what has changed with regard to the fundamental concepts. Since the previous report there have been failed attempts to replicate some of the original studies that set the foundations for some behavioural economic theory; we explore this ‘replication crisis’ and its implications. The chapter then moves on to explore other new theories that are behaviourally informed. It concludes by considering how behavioural economics can be applied in the context of information provision about HE.

## 3.1 Fundamental Concepts in Behavioural Economics

Behavioural economics posed a challenge to orthodox economics by questioning and, in some instances, replacing its models of human behaviour. It is a method of economic analysis that applies psychological insights into human behaviour to explain economic decision making. The orthodox model of ‘Homo economicus’

describes people as rational agents selfishly seeking to maximise utility, with unlimited capacity to process information.<sup>7</sup> There is also variation in the extent to which behavioural economists perceive behavioural economics to have replaced the typical models used in neoclassical economics, which were often based on unrealistic assumptions about an optimal decision making agent. This is in part as behavioural economists themselves vary, with some trained primarily in psychology or behavioural science and others in economics.

In summary however, behavioural economists tend to vary specific elements of standard economists decision making models to improve their fit with reality. Orthodox economics gave us a model of the optimal behaviour (or decision) in a particular situation, which provides a testable hypothesis for behavioural economists to examine through experiments to determine if people behave like this or not in reality. From these experiments behavioural economists have been able to observe where and why individuals' behaviours systematically vary. For example, through behaviourally informed empirical work psychologists have observed that people make inconsistent decisions over time. However, not all behavioural economists entirely discard standard utility models. Rather some behavioural economists, such as David Laibson of Harvard (1997), have modified them, for example by assuming non-linear or hyperbolic discount rates instead of using traditional, exponential discounting.

In the past five years there have been few substantial changes to the theories of people's behaviour with regard to information, but the science itself has undergone a testing time as its results and methods have been challenged. Following the publication of new evidence, the foundational claim about bounded rationality appears to remain sound, but some of the evidence around the specific ways in which decision making deviates from rationality have been questioned. The following sections summarise these developments.

### **3.1.0 Bounded Rationality**

A core concept presented in the previous report is bounded rationality (Simon, 1955). This recognises that people rarely have access to full and accurate information and, even when they do, they do not always process that information reliably or accurately because information processing capacities are necessarily limited. This is not a new concept; it was identified in the 1950s and further developed in the 1970s. It assumes that people also deviate from the rational model, and may prefer to 'satisfice' rather than 'maximise' (Simon, 1956). Insights from behavioural science are thus useful because they help us to understand how and why we deviate from rationality in certain circumstances. They have the potential to help us recognise and counteract defective judgements, and help us make better decisions. Indeed, we acknowledge that it has been influential with career theorists for some time. A recent thesis by McGrath (2018) used Simon's concept of 'satisficing' when conducting primary

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<sup>7</sup> [https://en.wikipedia.org/wiki/Homo\\_economicus](https://en.wikipedia.org/wiki/Homo_economicus)

research into how young people approach and complete the UCAS application process. The findings supported this idea, “as some students appeared to have accepted a university that was ‘good enough’ without looking for alternatives that might have been better” (p.202). However, she also found that some ‘optimised’ their information search and decision making where there is a means of identifying all possible options so it can be filtered against a specified goal. But a third ‘type’ is identified:

A more accurate description of the decision making style of such students might be pragmatism: searching for universities that best meet personal criteria, within the constraints of an uncertain process. (McGrath, 2018, p.203)

Those employing this approach tended to be more successful in their UCAS applications:

A willingness to modify goals in response to constraints and limitations of an uncertain process, meant that pragmatists usually had one or two ‘safe’ options they would be happy to accept. (McGrath, 2018, p.204)

It is tempting to consider the ‘pragmatism’ decision making style as a development in our understanding of career decision making with significant potential. However whilst useful, it was set out in a PhD thesis as a concept and has not been tested through robust empirical research, thus limiting its usefulness at this stage.

### **3.1.1 The ‘Replication Crisis’**

Following a wave of enthusiasm for behavioural economics amongst policymakers, and discussion of some of the concepts in the 2014 Advisory Study, the underlying science has found itself at the centre of a methodological crisis that questions the validity of some of its findings. As some attempts to replicate past experiments failed to confirm published results which were drawn on previously it is important for us to note any significant changes from the original findings.

Social psychology has occupied a central place in the crisis due to a combination of factors: questionable research practices (often unintentional but fairly common), sensationalised but under-powered research that gains a profile in the media (e.g. ‘power pose’ studies<sup>8</sup>), disinterest in replicated studies compared with new findings, and the complex nature of psychological effects which make them difficult to replicate across time and place. The problem is that

...if the results are delicate wilting flowers that only bloom under the care of certain experimenters, how relevant are they to the messy, noisy, chaotic world outside the lab? (Yong, 2015)

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<sup>8</sup> See for example these replication studies in a special issue of *Comprehensive Results in Social Psychology*: <https://www.tandfonline.com/doi/full/10.1080/23743603.2017.1309876>

Replicability can be defined as the probability of obtaining significant results in an exact replication of a study (Schimmack, 2017).<sup>9</sup> Studies that have attempted to measure the extent of reproducibility suggest that as little as one third to one half of experiments in psychology have reproducible results. For example, in the Reproducibility Project, the largest of its kind, 269 researchers attempted to replicate 98 studies, but were able to reproduce the results in only 39 cases (Open Science Collaboration, 2015). Interestingly, results from cognitive psychology are found to be more robust than those from social psychology (Open Science Collaboration, 2015). This suggests that certain types of evidence may be more useful for informing decision making because they appear to offer more fundamental and temporally robust accounts of human behaviour.

The replication crisis does not imply that psychological science is not valid overall; it means that there is evidence that certain practices could be improved. For this reason, there are few cases of a clear-cut reversal of findings about behavioural effects. One case where consensus has changed, however, concerns the priming effect.

Daniel Kahneman's book, *Thinking Fast and Slow* (2011), popularised a number of findings from behavioural economics which showed that the neoclassical economic model of human behaviour as a rational utility-maximiser were wrong. Kahneman used the metaphor of two cognitive "systems" to describe how people abandon rational calculation when information is plentiful but time is short and/or when the task is too difficult. Through the events of the replication crisis, many of the behavioural effects cited in the book have been tested and challenged. Kahneman's own research has withstood replication, with stronger evidence for anchoring effects (impact of the first piece of information on estimations that follow), for example, but the book's arguments about the priming effect (unconscious cues affect conscious judgements) has fared less well.

### **3.1.2 Updates to Behavioural Effects Following Replication**

Kahneman was amongst those behavioural scientists who called for and supported the replication of studies.<sup>10</sup> These efforts have helped to clarify understanding and to clear away the doubts surrounding psychological research caused by the crisis. Since then there have been a number of coordinated approaches to replication and re-examination of results. For example, the Many Labs Replication Project tested 13 studies with a single questionnaire administered to over six thousand participants (Klein et al., 2014). The outcome was that 10 of the 13 studies replicated consistently, one effect produced weak support for replicability, and two effects – both forms of

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<sup>9</sup> Although the terms are often used synonymously, there is a technical difference between 'reproduction' and 'replication': "Results are said to be reproducible if you analyse the same data again and get the same results. Results are replicable when you repeat the study to obtain fresh data and get the same results." <https://sciencebasedmedicine.org/where-are-we-with-the-replication-crisis/>

<sup>10</sup> <https://www.nature.com/news/nobel-laureate-challenges-psychologists-to-clean-up-their-act-1.11535>

priming – did not replicate. These results provide greater support for the anchoring effect, first described by Tversky and Kahneman (1974) as follows:

Different starting points yield different estimates, which are biased toward the initial values. We call this phenomenon anchoring. (Tversky & Kahneman, 1974, p.1128)

In summary, the replication crisis has led to better evidence about psychological effects. These events go some way to addressing concerns about the reliability of evidence in psychology. The latest findings confirm that cognitive biases and behavioural effects do exist under certain conditions. In summary, the replicated studies have weakened support for the priming effect (unconscious cues impacting on conscious judgements) but have strengthened evidence for anchoring effects. For other effects the evidence is mixed. Anchoring plausibly has an impact on the judgement of information about HE since it relates to reference values and the order in which information is presented – both of which are involved in processing information about HE.

Although we have a better evidence base for understanding which behavioural effects exist under laboratory conditions, what we still don't know is which effects actually affect the information behaviour and decision making of prospective students when accessing information about UK HE. It would also be useful to know the extent to which each effect impacts on these processes, and how this differs by socio-economic status, course of study and institution type. This is likely to be challenging, however, since the anchoring effect usually happens unconsciously. To address this gap in knowledge new primary research on the behavioural biases affecting HE decision making would need to be commissioned.

### **3.1.3 Heuristics and Biases**

We previously concluded that student choice is a form of decision making under uncertainty, because estimates of gains and losses depend on factors outside of a person's control and cannot be known in advance. To help understand the full impact of this on information, the key concepts in Tversky & Kahneman's (1974) pioneering article were cited to demonstrate that people rely on a limited number of heuristics (rules of thumb) which reduce the burden of complex decision making tasks, but which can lead to systematic errors or biases. The three main heuristics often cited are availability (judgements are affected by how easily information comes to mind), representativeness (judgements in which probabilities are evaluated by similarities) and anchoring (impact of the first piece of information on estimations that follow).

These are highly relevant ideas when considering HE decision making, for example availability and representativeness are useful when thinking about the context of decision making for those from lower socio-economic backgrounds. If an individual is unable to think of anyone 'like them' that has gone on a particular course at a university, then this will ultimately impact on the decisions that they make. The choice of institution is obviously influenced by its availability in an individual's mind, as well as how 'representative' it is in fitting with a student's perceived identity. Primarily, new evidence on these is found in the extensive literature available on



stereotypes and educational choices. Most recently, research in this area has focused on Science Technology Engineering and Maths (STEM) and potential interventions to address the gender and race gaps in achievement and engagement with these subjects. For example:

Research-based interventions to help students overcome the impact of stereotype threat include shaping their mindsets about learning and achievement. In particular, combating the culture of talent in STEM by encouraging students to view intelligence as a malleable quality rather than a fixed trait has been shown to reduce race and gender gaps in achievement. Furthermore, fostering students' sense of belonging—their feelings of being an accepted member of an academic community whose contributions are valued—has been linked to increased achievement and motivation, especially when those feelings of belonging are based on effort and engagement rather than underlying ability. (Good, 2014)

### 3.1.4 Thinking Fast and Slow Updated

The 'bat-and-ball' problem<sup>11</sup> exemplifies the difference between 'fast' (System 1) and 'slow' (System 2) approaches to judgement that Kahneman popularised (2011, p.44–45). It illustrates that in attempting challenging problems 'fast' intuitive thinking ('System 1') is more likely to be used but also more likely to be incorrect than 'slow' and deliberate reasoning ('System 2').

More recently, Trémolière & De Neys (2014) tested two versions of this classic problem. The results suggest that prior beliefs influence whether we think fast or slow. In this study, the problem was framed in terms of the cost of two cars. In the intuitive version, the cars were valued accurately. In the modified version, the cars were valued incongruently, i.e. a Ford was valued more than a Ferrari. More people answered the modified version correctly. The authors conclude that when an intuitive (but wrong) answer conflicts with other (correct) intuitions, people are more likely to engage in 'System 2' deliberate reasoning.

Results indicate that participants who solved the modified unbelievable version performed better than participants who solved the classic believable version. Our data highlight that prior beliefs, even in the bat-and-ball problem, can accidentally make people perform better, probably because they encourage them to adopt a more effortful processing strategy.

The findings support Kahneman's acknowledgement that certain forms of 'System 1' thinking are quick but not unreliable, as in the expert judgement of experienced chess players who can evaluate a board at a glance, or the instantaneous visual

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<sup>11</sup> The problem is: *If a bat and ball cost a total of £1.10, and the bat costs £1 more than the ball, how much does the ball cost?* The intuitive answer is 10p, but this is incorrect (because if so, then the bat costs £1, but £1 is only 90p more than the ball). The correct answer is 5p (bat £1.05 + ball £0.05 = total £1.10).

perception of differences in length between two bars on a graph. The point is that intuition is not always fallible and doesn't always lead to poor reasoning.

Indeed the psychologist Gerd Gigerenzer has spent his career focusing on the ways in which heuristics, rules of thumb and/or other mental shortcuts associated with System 1 thinking could actually lead us to make better decisions. Gigerenzer is a risk analyst and he argues that we make poor decisions on an array of issues, from health-care screenings to choosing modes of transport to investment decisions, in part because we blindly rely on data that has the potential to be incorrectly interpreted and reported. Gigerenzer (2014) draws on psychology, sociology and maths to explain how the presentation of data can start off clear and end up confused by the time it reaches its intended audience. To quote Gigerenzer:

Statistical innumeracy is often attributed to problems inside our minds. We disagree: the problem is not simply internal but lies in the external representation of information, and hence a solution exists. Every piece of statistical information needs a representation—that is, a form. Some forms tend to cloud minds, while others foster insight. We know of no medical institution that teaches the power of statistical representations; even worse, writers of information brochures for the public seem to prefer confusing representations.

He argues that this often leaves us helpless to make sound decisions about the risks involved in taking a particular decision. The implication of his work is that people have evolved into good intuitive statisticians and can gain insight, but only when information is presented simply and effectively.

Gigerenzer points out that Kahneman and Tversky's System 1 and System 2 model assumes that System 2 is (a) rational (i.e. follows the rules of probability) and (b) always correct. He critiques this model as he considers it to be too simplistic, in that it categorises but does not explain the underlying cognitive processes. He argues that our understanding of decision making should be more nuanced, suggesting that there are times when our reliance on heuristics or rules of thumb makes sense and other times when we should go to the effort of applying probability and statistics.

There are evidently differing views of usefulness of the theoretical model of System 1 and System 2 thinking. For an extended discussion of this, a paper by Samuels et al. (2012) sought to settle the debate between Kahneman and Gigerenzer, which has sometimes been referred to as the "rationality wars".

### **3.1.5 Information Overload and the Paradox of Choice**

*Mind, Society and Behaviour*, a report by the World Bank (2015), collates findings from a wide range of empirical studies. It uses various metaphors to describe findings from behavioural science which relate to the ideas of 'cognitive load' (Sweller, 1999) and 'bounded rationality' (Simon, 1955). Both of these concepts describe some of the limits to our ability to process information. The World Bank report says that "everyone has limited 'cognitive budgets' which can make decision making rather costly" (World Bank, 2015, p.86). The report also talks of 'cognitive

tax', which is equivalent to the concept of 'cognitive load' in psychology (Bawden & Robinson, 2009). The report also discusses 'cognitive bandwidth' in the context of decision making about HE and how it is affected by socio-economic status:

There are also important decisions that occur relatively infrequently and that inherently require considerable bandwidth. These might include applying to a university or choosing a health insurance plan. In the United States, for example, high school students taking a popular college entrance exam can choose to have their scores sent directly to the universities to which they plan to apply. Before the fall of 1997, students could send three reports for free, and each additional score report would have cost \$6 to send. When the number of reports they could send for free increased to four later that year, the number of test takers sending exactly four reports jumped from 3 percent to 74 percent (Pallais, forthcoming). More important, this increase in score reports induced low-income students to apply to and eventually attend more selective universities. Because attending a more selective university is associated with higher expected future earnings, an effective subsidy of \$6 improved the expected earnings for low-income students by an estimated \$10,000. (Bawden & Robinson, 2009, pp.88–89)

Amongst the more interesting findings relating to 'cognitive bandwidth' is new evidence that poverty has a negative impact on decision making. Evidence from a study on farmers in India suggests that financial scarcity can consume cognitive resources. Relative poverty in wealthier countries has a similar effect; for example financial anxiety in people below the poverty line in the US (Mani et al., 2013) leads to a "diminishment of executive function". Even temporary conditions of poverty can dramatically affect patterns of decision making: "...when placed in a context of scarcity, however brief, otherwise well-off subjects exhibited decision making patterns typically associated with poverty" (Mani et al., 2013, p.84).

Together, these natural and laboratory experiments suggest that financial concerns can absorb considerable cognitive bandwidth and that situations of scarcity can alter decision making in important ways for both low- and high-income populations. (World Bank, 2015, p.84)

Cognitive load theory (Sweller, 1988) is the idea that there are limits to the amount of information that can be processed by working (short-term) memory, but that more information can be processed when it comes from long-term memory. As part of the response to the replication crisis, cognitive load theory has itself been tested. For example, Kessler & Meier (2014) replicated a study that investigated the effect of manipulating cognitive load on charitable giving. A memorizing task was used to increase cognitive load. In the original study, participants under conditions of higher cognitive load gave twice as much money to charity and were 50% more likely to give. The more recent study involved four attempts to replicate, with only one matching the results of the original study.

This result does not invalidate cognitive load theory, however, nor does it tell us much about the interaction of cognitive load and information use in HE. What remains clear is that cognitive load is a useful concept when considering the

provision of information. Whilst its interaction with specific tasks is still being researched, the evidence is fairly clear that cognitive load imposes a cost on decision making and effectively limits performance in reasoning tasks, as we might anticipate given that the concept of bounded rationality identifies a limit to information processing. Camos (2017) provides a good summary of recent research in this area. The idea is finding application in pedagogy, where it is contributing to more effective teaching and learning strategies (see e.g. Ashman, 2017).

## **3.2 Other Principles in Behavioural Economics**

### **3.2.0 Behavioural Complexity**

Evidence is emerging of how adolescents' decision making compares with that of adults. One US study finds that although adolescents may be stereotyped as making poor choices, new evidence suggests that adolescents demonstrate adult levels of cognitive capability (Steinberg et al., 2009). Cognitive capacity was tested with various numerical and verbal reasoning tasks. Beyond the age of 16 there are few measurable differences in cognitive capability by age. These results contrast with those for adolescent maturity, however. Steinberg et al. (2009) also measured psychosocial maturity with tasks relating to risk perception, impulsivity, resistance to peer influence and orientation to the future. The results indicate that maturity develops between early teens and mid-30s. Therefore, "adolescents reach adult levels of cognitive capability several years before they reach adult levels of psychosocial maturity" (Steinberg et al., 2009, p.592).

A more recent study supports the finding about cognitive capability, with evidence that most prospective HE students are within the age band that is most capable of processing information. Gauvrit et al. (2017) provides evidence that human behavioural complexity varies with age. The experiment involved a random number generation task to measure behavioural complexity. Participants were tasked with generating strings of pseudorandom numbers, based on the premise that "The complexity of a subject-produced pseudorandom sequence may serve as a direct measure of cognitive functioning" (p.2). The results show that behavioural complexity correlates with cognitive ability; it peaks at age 25 and begins to decline from age 60 (Figure 4).

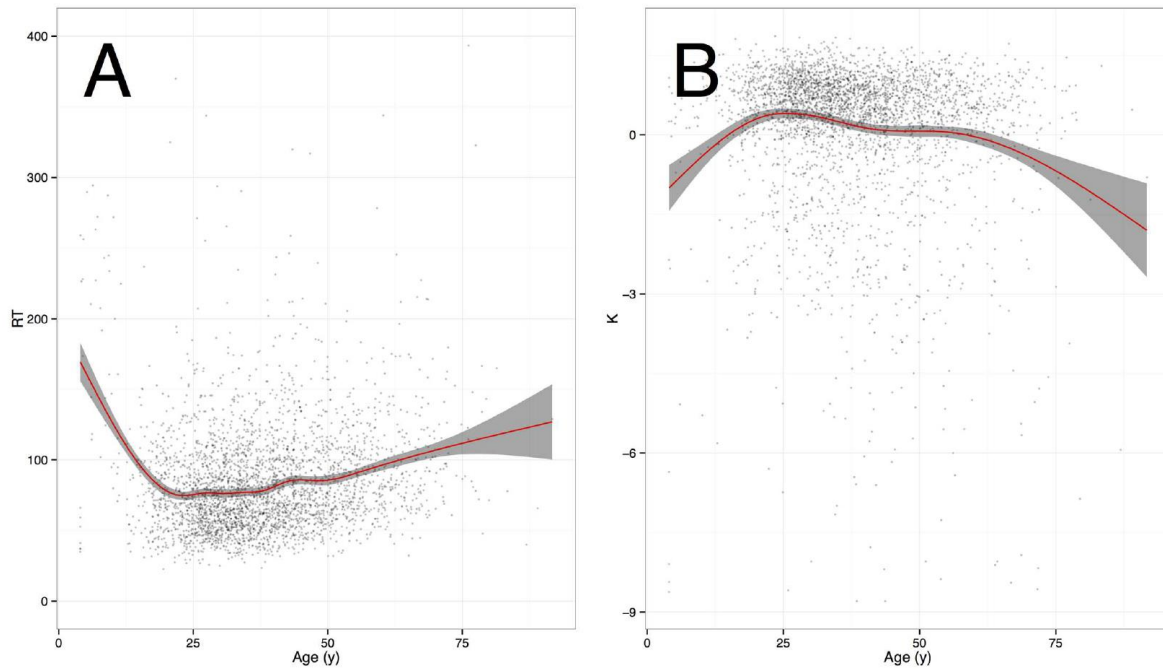


Figure 4: Total task completion time (A) and mean complexity (B) as a function of age. (Gauvrit et al., 2017)

The same study also suggests that “Humans [...] have a keen ability to detect structure, both of statistic and algorithmic nature” (Gauvrit et al., 2017, p.2). This ties in with the arguments for using data visualisation a way of reducing cognitive load when processing large amounts of information for decision making (see Appendix 3 in the Advisory Study, 2014). Fitting with the trend towards increased accessibility of information via visual tools (such as infographics), this research suggests that we are better at finding patterns in visual information than in numerical – it involves less cognitive load, is quicker, more accurate and more reliable. The implication for the provision of data about HE is that prospective students would benefit if quantitative data that is currently presented numerically (in tables) were instead presented graphically (in charts). Not only would this enable people to make better judgements, it would allow for the processing of greater quantities of data and would widen accessibility.

### 3.2.1 Affective Forecasting

Our ability to make decisions today relies on our ability to correctly forecast what our future feelings might be. Consequently our decisions are only as good as the forecast on which they are based and psychologists have endeavoured to explain this through their theory of ‘affective forecasting’.

Affective forecasting deals with the ways in which an individual’s forecasts of how much they will benefit from an experience can be systematically incorrect. Affective forecasts have been a central theme of work by authors such as Wilson & Gilbert (2003), Loewenstein et al. (2003). They found that people exaggerate the degree to which their future tastes will resemble their current tastes. Their evidence demonstrates the prevalence of this bias, and they developed a formal model of it

which they use to demonstrate its importance in decision making environments. Clearly this concept is highly relevant to prospective students' decision making. This is not least because prospective students may overestimate the impact studying a higher education course may have on their future happiness. Or conversely how unhappy they will be if they do not manage to secure their preferred choice of course at a higher education provider.

### **3.3 Decision Making and Neuro-economics**

Over the past 10 years or so, there has been a trend to apply findings from neuroscience to a wide range of otherwise unconnected fields of study. In the discipline of economics, for example:

A new field emerged, referred to as neuroeconomics, focusing on the description of algorithms underlying observed choice and their biophysical implementation. Human decision making would thereby become understandable at a lower level of description than the traditional, abstract, axiomatic approach had done. (Bossaerts & Murawski, 2015, p.38)

Neuroeconomics has the potential to develop into a fruitful avenue of research that could complement cognitive studies that offer explanations for behaviour at a higher level of abstraction. But the quality of research in such areas varies considerably, and the extent to which findings about brain structure and function can inform studies of information use is still open to debate.

While it may be interesting to know which neural algorithms implement observed choice, and what biophysical constraints cause violations of the axioms of choice theory, such knowledge is deemed irrelevant for the future development of choice theory (p.39)

### **3.4 Applications of Behavioural Economics**

#### **3.4.0 Trialling Behaviourally Informed Approaches to Information Provision**

The Financial Capability Lab ('the Lab') is undertaking work as part of the Money Advice Service's efforts to improve people's financial capability.<sup>12</sup> The Lab tested numeracy performance amongst "financially squeezed" people with a view to generating evidence about 'what works' (BIT & Ipsos MORI, 2018). The project covers issues relating to building savings, accessing financial advice and managing credit, whilst participants are divided into three groups: cushioned, squeezed and struggling. One part of this research investigated how comprehension could be improved by using simple, salient and interactive information. Behavioural effects that were tested included information overload and salience.

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<sup>12</sup> <https://www.fincap.org.uk/financial-capability-lab>

These tests demonstrate that product information can be compliant with existing regulations on the provision of information without overloading and confusing consumers. Behaviourally informed approaches can highlight the information people need to know, when they need to know it. (BIT & Ipsos MORI, 2018, p.27)

The results indicate that “information is often ignored when it is not presented in a way that will attract attention or is not relevant to the decision immediately at hand” (p.27). This finding has implications for the presentation of data, particularly financial information. It suggests that de-cluttering pages of information is beneficial to information-processing tasks.

Edward Tufte (1983) coined the term ‘chartjunk’ to refer to useless, non-informative information presented with or as part of salient data displays. He advocates the elimination of chartjunk as part of his wider principle for effective communication which states that it should be the task of the designer to maximise the ‘data-ink ratio’. Findings such as those from the Lab provide empirical support for these informal graphic design principles.

In another element of their research, the Lab tested various applications of behavioural insights to tasks involving financial decisions, with a view to understanding how these insights interact with different levels of numeracy:

In the Lab we used insights from behavioural science to develop ideas that we thought would improve people’s financial decisions. These included asking people to indicate the date when they wanted their debt to be repaid by instead of just the amount they wanted to repay each month, and presenting the key attributes of a credit card in a simple, salient and interactive way.

Our results suggest that these ideas helped participants with both higher and lower numeracy scores. This means that these ideas did not exclusively support low or high numeracy individuals, but helped people, on average, to make better decisions. (Ter Meer & Mawby, 2018)

These studies on financial capability offer insights into the use of information for credit cards, price comparison websites and savings accounts. However, another study conducted by the Behavioural Insights Team (BIT), in collaboration with the Department for Education and UCAS, focuses specifically on higher education (Sanders et al., 2017). Their three-year study involved over 11,000 students. High-achieving students received different types of letter containing information encouraging them to apply to university – either from a male student sent to school, from a female student sent to home, or both. Receiving both letters led to increased applications of around 20% overall, and to Russell Group universities of around 10% (Figure 5). But there was no statistically significant effect on applications overall. In line with the replication efforts in psychology, BIT state that is important to publish non-significant effects:

...it's important to present null results, both because they can be learned from, and because publication bias is an immense challenge to evidence-based practice. However, to practitioners in the HE sector, this also reassured them that in the process of learning What Works, it is natural to find some things along the way that don't. (Hume, 2018)

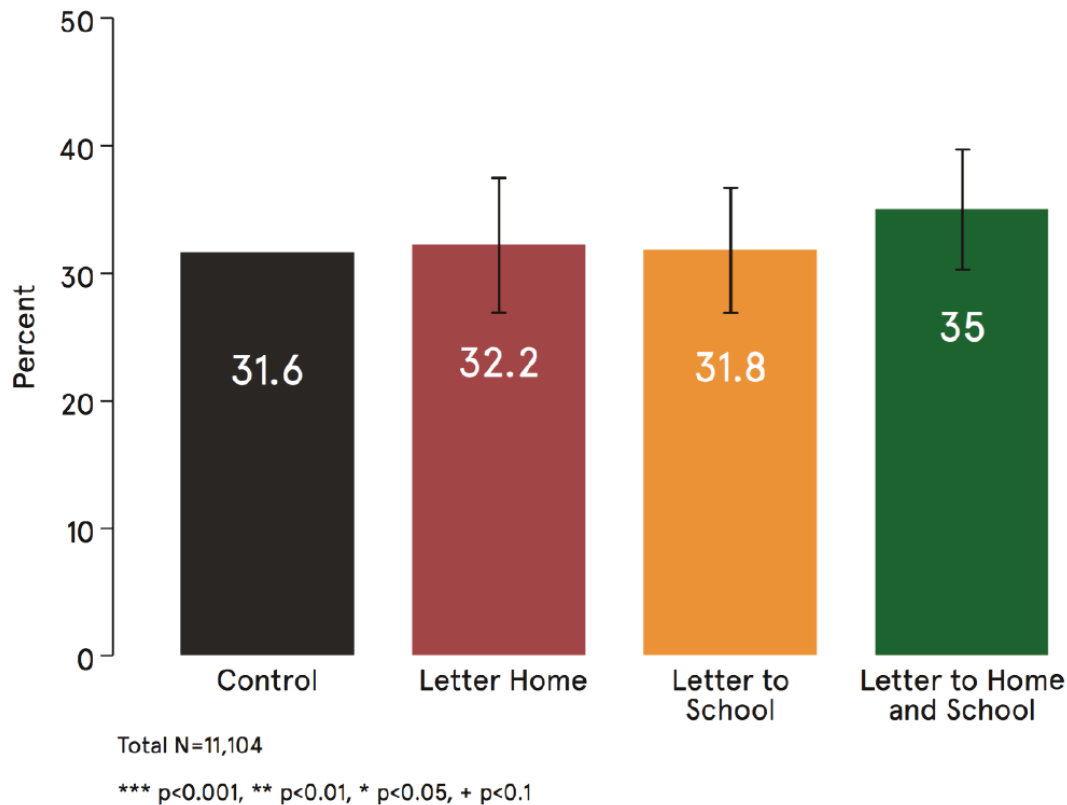


Figure 5: Effect of letters on applications to university (Sanders et al., 2017, p.14)

Other trials have sought to identify interventions that might drive a particular subject choice, for example the field experiment by Harackiewicz et al., (2012). This trial tested an intervention aimed at parents to highlight the usefulness of STEM subjects in high school to increase the numbers studying STEM subjects. A relatively simple intervention of brochures and a website was found to have a significant impact and “Parents are an untapped resource for increasing STEM motivation in adolescents” (Harackiewicz et al., 2012).

### 3.4.1 Frameworks for Applying Behavioural Insights

If policy makers wish to bring about changes in the information behaviours of prospective students, they will require a framework or approach to inform their strategies for doing so. During the past five years there has been a proliferation of such frameworks, which can initially be used to help in classifying types of behaviour that a policy maker might seek to change. Such frameworks are also intended to help guide policy makers in deciding which interventions and policy approaches are likely to be most effective in influencing particular types of behaviour.



Professor Susan Michie (Professor of Health Psychology and Director of the Centre for Behaviour Change at UCL) reviewed the frameworks that are currently available. She concluded that none are comprehensive and conceptually coherent (Michie & West, 2011). Specifically she passed comment on the MINDSPACE report (Dolan et al., 2012), an influential report from the UK's Institute of Government and the UK's Behavioural Insights Team, saying:

[It] does not appear to encompass all the important intervention types. Moreover, the list is a mixture of modes of delivery (*e.g.*, messenger), stimulus attributes (*e.g.*, salience), characteristics of the recipient (*e.g.*, ego), policy strategies (*e.g.*, defaults), mechanisms of action (*e.g.*, priming), and related psychological constructs (*e.g.*, affect). In that sense it lacks coherence. The report recognises two systems by which human behaviour can be influenced – the reflective and the automatic – but it focuses on the latter and does not attempt to link influences on behaviour with these two systems. (Michie et al. 2011)

Michie and colleagues Lou Atkins and Robert West developed an alternative framework, called the COM-B system. Michie et al. (2011) placed it at the centre of their approach to evaluating behaviours, which is visualised as a 'Behaviour Change Wheel' (Figure 6). In developing the behaviour change wheel and the subsidiary COM-B Model, they evaluated a range of frameworks for behavioural change for their usefulness, defined in terms of coverage of behavioural effects, coherence of the framework, and links to overarching models of behaviour.

The COM-B system has been widely adopted by behavioural insights leads across the UK's central government departments. Furthermore, the COM-B visual representations (reproduced in Figure 7) are well explained, and clear guidance is available to support the application of the model in practice.

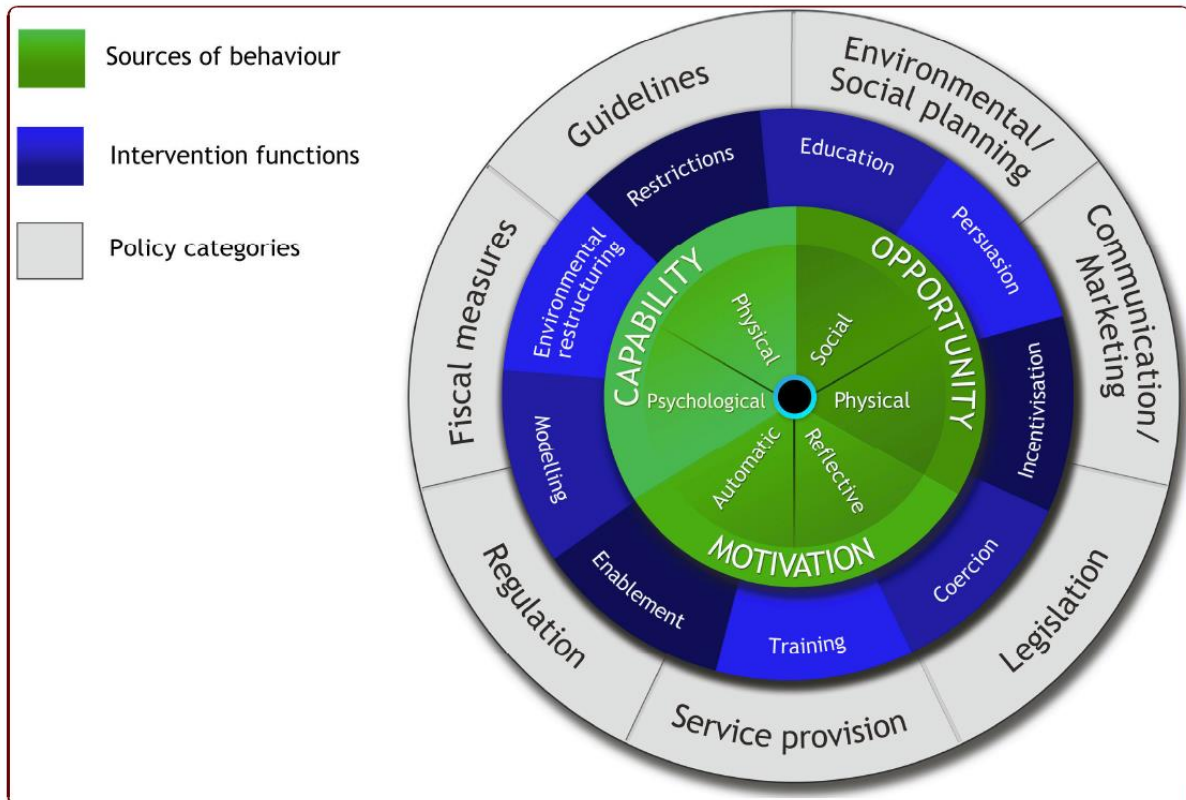


Figure 6: The Behaviour Change Wheel. (Michie et al. 2011; colours changed from original)

In the wheel surrounding the central COM-B system is a middle layer that represents nine types of intervention functions. The outer layer represents seven categories of policy that could be addressed with those interventions.

The idea is to work from the centre of the wheel outwards and begin by mapping the types of behaviours – in this case, information seeking and information use behaviours – that one might want to influence. Once the behaviours have been assessed one can then consider which intervention functions and policy categories might be most relevant. Corresponding tables are available that enable one to map sources of behaviour to intervention functions and policy categories in more detail.

The COM-B hub at the centre of the wheel helps to identify the sources of the behaviour that could prove fruitful as targets for intervention. It uses the ‘COM-B’ (‘capability’, ‘opportunity’, ‘motivation’ and ‘behaviour’) model of behavioural change (Figure 7), which says that behaviour is part of an interacting system involving all these components, as follows:

- Capability – “the psychological and physical capacity to engage in [an] activity”
- Motivation – “brain processes that energise and direct behaviour”
- Opportunity – “factors that lie outside the individual that make behaviour possible”
- Behaviour – “the activity that is to be changed”

This would also apply to information behaviours of prospective students.

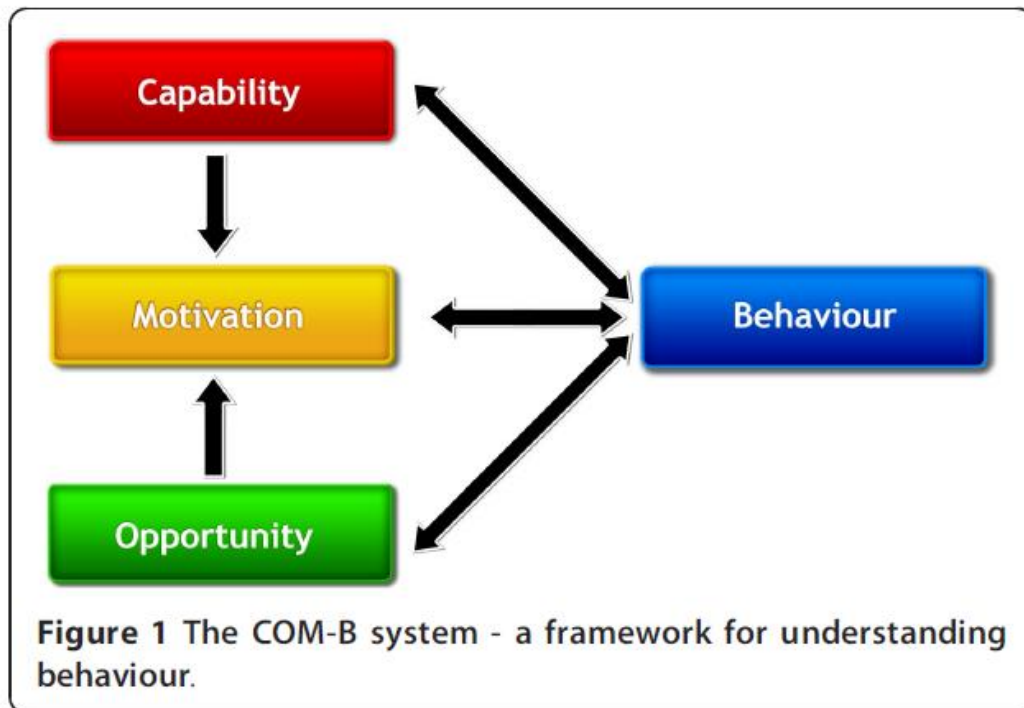


Figure 7: The COM-B model. (Michie et al. 2011)

### 3.4.2 Improving Decision making in Higher Education

What we can take from the COM-B model is that it is insufficient to provide the **opportunity** – i.e., access to centralised data to inform prospective HE students’ decision making – and expect that it will be rationally digested in such a way as to result in them making the right choice for them.

Prospective students each need to also have to have the **capability** to engage with that data or source of information and with the task of dealing with the complexity of the decision making process themselves. They also have to have the capability to understand what the limitations of any available data might be. Then the **motivation** to direct their energies to information seeking and to digesting the data or information that becomes available to them. Motivation is also required if they are to compare different courses and institutions, and not default to a similar choice to that made by their peers, which would reduce the amount of energy they need to expend. The right opportunities also need to be available to prospective students, both to enable them to access useful data and information and to make the most of it once they have accessed it. A key consideration here is the availability of opportunities for prospective students to discuss the data or information that they have accessed with a parent, careers advisor or trusted other who could help to guide them. The COM-B model helps us to understand that the information behaviours of prospective students are all part of a combination of the interactions of these factors.

The next necessary step would to map the types of information behaviours or prospective students onto the COM-B model. This would facilitate the identification of interventions that might be useful to effect change in any information behaviours

of prospective students that might limit their ability to make the right decision for them.

If we take an initial look at the COM-B model and behaviour change wheel from the perspective of HE decision making then the categories that stand out as key are ‘communications’ and ‘marketing’. This is primarily as one would consider influencing the information behaviours of prospective students to be about changes in the provision of information. However to affect change in behaviours, consideration might also need to be given to ‘education’ or ‘modelling’. The latter would be particularly pertinent as a type of intervention if using ambassadors to convey messages to try to overcome the ‘HE is not for people like me’ challenge.

### **3.5 Key Findings**

Our understanding of people’s behaviour regarding the use of information has changed relatively little over the past five years; the majority of the core concepts from behavioural science still stand. Here is a summary of the new findings reported in this chapter:

- While a large and robust evidence base for understanding which behavioural effects exist, this is under laboratory conditions and there is a lack of evidence of which effects actually affect the information behaviour and decision making of prospective HE students.
- The application of behaviourally informed approaches to information provision in other contexts highlights the need to test potential interventions or different presentations of information, as the true effects of heuristics and biases in all circumstances are unknown.
- Student choice is a form of decision making under uncertainty, where heuristics (rules of thumb) tend to be relied upon to reduce the burden of processing information. Concepts like representativeness are useful in HE decision making contexts as the ability for an individual to think of anyone “like them” taking a particular route, or the fit of a course or institution with their perceived identity will play a role in their decision making.
- There are limitations to the amount of information processing that people can undertake when making a decision about whether to enter higher education and which course or university to attend. Most applicants to HE are within the age band that is most capable of processing information, new evidence suggests. However, adolescents demonstrate adult levels of cognitive capability earlier than they develop emotional and social maturity.
- There are new tools to support the application of behavioural economic and psychology principles in practice. The currently most widely used framework is the COM-B system due to the simplicity and coherence of the model. However, it remains impossible to know whether a ‘best choice’ has been made so the role of HE information providers remains the empowerment of individuals to make better choices for themselves.

Therefore, further primary research, particularly randomised control trials, would be needed to inform a robust approach to information provision. Such trials could be focused on the needs of particular information users and or on influencing particular types of information behaviours.

# 4. Social and Environmental Influences

## 4.0 Chapter Overview

Where the previous chapter explored updates to knowledge of the ways in which people process information relating to HE, the present chapter revisits the characteristics of the HE decision making environment and the inter-relations between decision makers and other people in this environment.

The original Advisory Study outlined that the field of sociology was another useful route to consider when exploring human behaviour. In this chapter we revisit the concepts of sociology to explore new evidence on the impact of social and environmental influences which affect those seeking information about HE. We also introduce research that argues of a need to move beyond certain core concepts from social theory, in investigating the enduring relationship between socio-economic background and access to higher education. The chapter concludes by considering the influence of schools and other key influencers on the transition of prospective students into HE.

## 4.1 Social Theory of HE Information and Decision Making

Knowledge from sociology is useful in understanding the environment that influences decision making. Our prior study outlined evidence to demonstrate the social, cultural and institutional factors which influence the way people engage with information-seeking behaviour. We found that socio-economic background, school and key influential people constitute the environment in which choices about HE are considered, and these consequently affect the decision itself. Previously, we identified Reay et al.'s (2005) *Degrees of Choice* as one of the most useful analyses of sociology and behavioural economics in the context of HE choice. This book shows how both approaches demonstrate that the rational choice theory of traditional economics is simplistic, with evidence that:

...decision making is often a messy process in which intuition, affective response and serendipity can play a greater role than rational calculation and systematic evaluation of the evidence available. (Reay, et al. 2005, p.xi)

### 4.1.0 Field, Habitus and Cultural Capital

Bourdieu's social theory based on three related concepts (field, habitus and cultural capital) is a useful tool to understand processes that enable and constrain choice. Most relevant to this report is its use as a framework in research into social inequalities and widening participation in HE, as summarised in the Advisory Study previously. We outline several examples below where researchers have revisited Bourdieu's theory and considered its usefulness in understanding information use

and decision making regarding higher education since the Advisory Study was published.

The recent meta-analysis by Webb et al. (2017) reviewed the use of Bourdieusian theory in widening participation research specifically, and argued for a need to move beyond it to better understand social inequalities in higher education. In particular, they advocate using theories extending from Bourdieu, such as Schatzki and Kemmis, “which permits researchers to usefully consider the internal goods of a practice and the role of institutions and the non-human”. They also state that:

...widening participation research requires the conjoining of understandings of the social causation and social formation of educational inequalities; comprehensive uses of Bourdieusian concepts are needed to inductively analyse the interrelationships and interdependencies between practices in fields. (Webb et al., 2017, p.153)

Other researchers, such as Bathmaker (2015) have focused specifically on the potential to offer a more nuanced understanding of “how complex and intersecting social inequalities in higher education are realised or challenged”. In particular, the concepts of ‘field’ and ‘habitus’ have been used to examine equality and diversity in HE participation. Bathmaker (2014) argues that Bourdieu’s concept of field also has relevance in examining HE participation in England in the context of more diverse and differentiated HE provision:

In England, the role of further education colleges in the provision of HE raises questions about how these institutions relate to the HE field. Are they part of the field? Do they form a different field? Are they a subfield or part of an overlapping field? Do they represent a ‘hybrid’ space created by porous borders between fields? And does this make any difference to their practices, to ways of playing the game? (Bathmaker, 2015, p.69)

The argument being that those who are ‘raised’ in a particular field (e.g. in a vocational further education college) may find it challenging to move to the different structure of HE, and equally, students accessing HE may find difficulty dealing with the constant change that is found there.

More practically, Gale (2017) has focused on the application of Bourdieu’s conceptual tools of ‘cultural capital’ and field ‘distinction’, specifically with regard to the retention of students from lower socio-economic backgrounds once they have entered HE. Gale’s application of Bourdieu focuses on why Australian HE students from under-represented groups are retained at similar rates to their more advantaged peers. This research highlights the need to focus on how HE institutions and systems produce attrition, and that insights from Bourdieu reveal:

That educational institutions misrecognise the cultural advantages of dominant social groups as academic achievement. Differential access to cultural capital positions disadvantaged groups as less academically able and thus more susceptible to attrition. (Gale, 2017)

The insight here is in recognising that student attrition is not always about students being unprepared academically for HE study; rather there are other influences on why students discontinue their studies. Greater understanding is needed of these exit drivers and of the role that the provision of information can play in reducing attrition, particularly when provided before or after students commence HE study.

#### **4.1.1 Socio-economic Background**

It has been argued that HE only adds to social stratification and inequality, because students from a high socio-economic background are more likely to attend, and because courses with more students from a high socio-economic background get better labour market outcomes. Abbiati et al. (2017) investigated information barriers and social stratification in HE. They conducted a large-scale randomised experiment involving 9,000 students from 62 Italian schools. The study involved an experimental treatment in the form of an ‘information initiative’ which was designed to correct students’ misperceptions of the profitability of HE:

The information initiative provided treated students with detailed information about: (1) the direct and indirect costs of university and vocational programmes; (2) the occupational prospects of graduates of these programmes; (3) the chances of successfully completing them. (Abbiati et al., 2017, p.10)

A longitudinal survey traced educational trajectories, aiming to understand whether and how information barriers constrain participation in HE. The results indicate that “Student misperceptions reflect the degree of complexity of HE and the weaknesses of university advising” (p.6). A significant finding for this review concerns the extent to which ‘strong’ fields of study – i.e. those that have the highest chance of leading to more financially-rewarding jobs (including engineering, ICT and medicine) – were chosen compared with ‘weak fields’ (such as political science and sociology):

...providing students with detailed information concerning HE options can indeed foster a more efficient allocation of students among tertiary-level programmes. Compared with the control group, treated students reduced substantially their propensity to choose weak fields, which currently face strong credential inflation in Italy, and increased their participation in vocational programmes, which are more aligned with the skill demands of the labour market. (Abbiati et al., 2017, p.18)

The study provides evidence that the information intervention improved the occupational prospects of students in both high and low socio-economic groups. Treated students enrolled less often in less remunerative programmes of study in favour of more vocational programmes, but this effect varies with social class and level of education. More students with less-educated parents opted for vocational programmes, whereas more students with tertiary-educated parents increased participation in potentially more financially rewarding programmes of study. The author’s conclusions emphasise that information is context-dependent:



However, we cannot conclude that this information initiative benefited working-class students more, because it did not enhance their overall take-up rates of HE, nor their access to strong fields of study. If our interpretation is correct, this is because the messages conveyed by the treatment were processed differently according to their class-specific sets of preferences, opportunities and constraints. (Abbiati et al., 2017, p.19)

So the implication is that providers of information about HE need to be aware that the same information is likely to be processed differently by individual prospective students, in part as a result of their socio-economic backgrounds.

There is potentially another factor at play here too. In our previous report we cited research (Harrison & Hatt, 2011) that suggested that for students from lower socio-economic groups, elite universities are seen to be “not for people like us”; highly qualified students from poorer backgrounds are less likely to apply to top universities than those from wealthier backgrounds. This evidence suggests that social norms can impact on the relationship between the information presented, and decisions about which HE institutions students from different socio-economic backgrounds apply to. It should be noted that other work by Kettley & Whitehead (2011) claims that the influence of socio-economic background is perhaps more subtle than both Archer et al. (2007) and Harrison & Hatt (2011) suggest.

There remains an evidence gap with regard to how lower socio-economic groups engage with information and how this affects decision making. Yet it seems increasingly apparent that there is a “not for people like us” effect. Furthermore, more recent evidence as presented later in this report (section 5.1.2) highlights adverse effects resulting from the introduction of the Teaching Excellence Framework (TEF) Gold/Silver/Bronze system (Trendence UK, 2017). With the specific finding that 6% of students, higher for black and minority ethnic (BME) students at 11%, would have reconsidered applying to their institution, if not discounted it entirely, if it was rated Gold. A potential implication of this is that for some prospective students, the idea of a Gold university is “not for the likes of me”. Such a finding warrants further investigation to ensure the new system does not have the potential to put any particular prospective students (especially those from lower socio-economic groups) off applying because of a particular grading.

One potential reason why information may be processed differently by different groups of students is due to differences in the way in which individuals perceive value in HE participation and particular HE courses. For example, a recent survey of applicants to HE shows that although financial factors are not on average the biggest influence on whether to apply, financial factors have a greater effect on applicants from lower socio-economic groups (Fagence & Hansom, 2018).

Recent research provides some guidance on how best to support the multiple and varying needs of information users. One study evaluated the information skills and support needs of first-year students from lower socio-economic backgrounds and who were struggling with academic demands. An 18-month pilot scheme comprised

student-centred support embedded in the course (Reading, 2016). Students from a lower socio-economic background in an Australian university were not the most likely to be identified as having the greatest needs. Groups of students more readily identified as struggling included those with English as a second language, mature students, those with low prior attainment, international students and ‘at risk’ students (Reading, 2016, p.698). The message to take away from this study is that economic disadvantage and the needs for support with information skills are not synonymous groups.

Another Australian study explored the information needs of parents, highlighting that the users of information about HE can be much wider than prospective applicants only. The findings indicate

There is a need for more information about university study, including information about study options and related support... to be provided directly to parents and carers. (Abingdon Advisory, 2015, p.3)

This is of particular interest when considered with the trials discussed in Chapter 3, where information provided to parents was found to have an impact on the decisions made by their children.

The engagement of parents is a theme that has emerged in CFE Research’s ongoing evaluation of the National Collaborative Outreach Programme (NCOP) for the OfS. This evaluation included a survey responses from over 28,000 NCOP learners in Years 9 to 13 studying in schools, sixth form colleges and further education colleges (FECs) across 27 consortia. The results of this survey reveal that a third of NCOP learners are aware that they would be the first in their family to attend HE should they progress. Interestingly, a similar proportion did not know whether anyone else in their immediate family has HE experience. Despite their relative lack of direct HE experience, family was found to be one of the strongest influences on learners’ decision making. We know that parents have a significant influence on the decisions that young people make about careers and education, yet a substantial proportion of NCOP learners know of no-one in their family who has experience of HE. Consequently NCOP consortia recognise the importance of engaging parents, but they are finding this challenging and there is yet little evidence that they have plans for how they will achieve this. Some consortia are seeking to reach out to parents in their communities in recognition of the fact that not all parents are willing to engage in a school/educational setting.

In providing for the needs of information users who face disadvantage, the type of information can be as critical as the means by which that information is accessed. For example, in response to a consultation on proposed changes to Unistats, the National Union of Students (NUS) voiced concern about the removal of information about living costs and financial support. Research published by the OfS in 2018 found that “24% of students do not feel that they were informed about how much everything would cost as a student. The main factors cited are the costs of

accommodation, books and paying for extracurricular activities” (OfS, 2018). CFE’s prior research for DfE into Post-16 Choices (CFE Research & Hughes, 2017), highlighted that cost information is particularly important for prospective students from lower socio-economic groups. However, there remain difficulties in the collection of this data and presenting this with accuracy which makes this a complicated area to fulfil prospective student’s needs.

Furthermore, CFE’s evaluation of NCOP shows that school-aged learners are, overall, “less knowledgeable about the practical elements of HE, including the costs, funding available and accommodation options”. This finding highlights again why information provision for parents, as well as young people, on the costs of HE and the funding available has the potential to be particularly impactful. This is also important as prior research by CFE & BMG Research (2017) suggests that the perceived cost of HE can (negatively) influence parental views, particularly amongst disadvantaged groups.

A report from the Sutton Trust looks at the information needs of prospective students from lower socio-economic groups from a different angle. It focused on the role of predicted grades in the HE admissions process (Wyness, 2017). Predicted grades – rather than actual – are often used as the basis for decision making about whether to attend university. The study found:

Evidence shows that the majority of grades are over-predicted, which could encourage students to make more aspirational choices. However, high attaining disadvantaged students are more likely to have their grades under-predicted than their richer counterparts. This could result in them applying to universities which are less selective than their credentials would permit. (p.3)

Further research by Wyness into educational decisions provides evidence that young people who are already best placed to take advantage of information are more likely to do so than those who stand to gain more from doing so (McGuigan et al., 2016). The study also reveals that the factors that influence propensity to access information “are the same variables one would expect to influence human capital decisions as well as other investment decisions more broadly” (p.512). Where students lack basic facts about the costs and benefits of higher education, simple and inexpensive information campaigns can be effective.

So prospective students from lower socio-economic groups typically access fewer sources of information during their decision making process. Furthermore, high ability disadvantaged students tend to lack the information, advice and guidance needed for the application process and or to ensure that they apply to highest tariff institutions that their grades would permit. Moreover they lack knowledge of the many parameters involved in the process, which means that “many disadvantaged students may be making sub-optimal decisions on where to apply” (Wyness, 2017, p.10). We also know from evidence on UK admissions that more students from disadvantaged backgrounds end up at lower-quality universities than their higher-income counterparts (Chowdry et al., 2013).

Therefore simply providing access to information for disadvantaged prospective students may not be sufficient. Furthermore it is important to acknowledge that accessing information – even if provided for free online – carries a cost in terms of time and effort. For certain groups, even freely accessible information may be too difficult or costly to access, and so support needs to be carefully tailored and embedded in the curriculum (McGuigan et al., 2016, p.513). CFE’s research into post-16 choices previously recommended that special focusing must be given to the information needs of particular groups of prospective students who experience difficulty in course choice and decision making, such as BAME groups and learners with SEN.

CFE’s more recent evaluation of NCOP (2017) revealed that school age pupils’ (NCOP learners’) knowledge of how HE can benefit those who study at that level and their confidence in their ability to cope with the demands of HE is high and increases with age. Our report from the first year of the evaluation found that:

The closer a young person gets to the transition point aged 18, the greater their self-reported confidence and knowledge of the benefits of HE are. Black and Asian learners report the highest levels of knowledge and confidence; disabled students are typically less positive about the likely benefits of HE for them and their ability to cope with the demands of studying at a HE.

There is therefore a need to support young people and their parents to access and make effective use of information, advice and guidance (IAG) in order for them (and their families) to have *meaningful careers dialogue* that supports their education and career decisions. There is scope, for example, to trial the provision of information to parents, in such a way so as to provide information but also guidance on how parents could communicate with their children and personalise the relevance of certain HE choices for them. Similar studies have been trialled in the USA and have proved to have a positive effect on the uptake of STEM courses (Harackiewicz, 2012).

#### **4.1.2 The Influence of Schools on the Transition to HE**

Work by Byrom (2009) and Dunne et al. (2013) was discussed in the original study to illustrate the high level of influence teachers and school environments can have on HE applications and aspirations. The implications were that the social influence of institutions needed to be recognised, as well as that of families and friends. Schools are also particularly crucial in helping to identify pupils who would benefit from advice and guidance relating to decision making about entry to HE.

Recent research on national factors related to schools in Scotland and in the USA indicates that curriculum plays a role in explaining the gap in social class effects entering top HE institutions. The research identified that the type of subjects played a key role in social class differences:

Our results showed that in Scotland, the *type of subjects* studied in secondary school had the strongest role in mediating social class differences in entering

‘ancient’ universities, stronger than the *number* of Highers/Advanced Highers studied and the obtained *grades* for these courses. Accounting for type of subjects not only reduced social class differences substantially but also reduced the gap to the point of no longer being statistically significant. (Dute et al., 2017)

This highlights that earlier education choices can influence decision making around HE choices. The implications of this are the need to support students in making choices that have the potential to influence or determine future education opportunities, to remove any potential barriers.

#### **4.1.3 Key Influencers**

A significant number of research studies outlined in the 2014 study found that peers, teachers, careers guidance officers and parents had an influence on people’s interests, and on their choices. Comparatively, less research has been conducted with students to identify their sources and preferences of information, and how these interact with other influences as students make educational choices.

A recent CFE study found that students use a wide range of sources, with very few not using any at all. A survey amongst students aged 16–19 currently engaged in the post-16 sector in England found that the vast majority consulted with at least one individual for help and support, on average consulting with three individuals (e.g. parents/carers, teachers, friends) and two resources (e.g. UCAS and individual provider websites) (CFE Research & Hughes, 2017). This report also identified that while the majority find it easy to decide which post-16/post-18 course to apply for, BAME students and those with SEN more likely to find decision making difficult and to need more support and guidance as a result.

Research with prospective HE students found that younger students are more likely to use university visits to inform their decision making than mature students, and regard this as the most useful source of information (Bowes et al., 2015). There was also a clear difference in what elements of information were seen as useful for mature and part-time students, which led to them being likely to use fewer sources of information:

In contrast, mature and part-time students attach greater importance to information on the costs of HE. Mode and location of study are often key considerations for mature and part-time students, and those with family and/or work commitments in particular. These factors can constrain choices and reduce the need to compare a wide range of courses and/or institutions in order to narrow down the options available. (Bowes et al., 2015)

Students from families with no prior HE experience also placed greater importance on the costs of HE and practical considerations such as travel and accommodation.

These studies highlight the diversity of information needs and behaviours, including the interaction of information with advice and guidance being different for each individual. A potential area for further study would be to understand the relationship

between information, advice and guidance in different scenarios to identify the impact different interactions of the three might have in terms of different information needs or behaviours.

#### **4.1.4 Unpacking Instrumentalism and Students as Consumers**

Expectancy value theories developed in psychology since the 1950s provide a more detailed explanation of the motivating factors behind information seeking. During the past 30 years, Eccles et al.'s (1983) comprehensive social-psychological Expectancy-Value Model of Motivated Behavioural Choices (EV-MBC model) has also proved suitable for studying educational choices. This theory of motivational factors focuses on individuals' beliefs about the probability of success in information seeking and the perceived value of the outcome of this activity. Existing evidence suggests that both 'expectancy value' (how confident the prospective student is about their potential success in HE) and 'task value' (how useful or enjoyable the prospective student perceives HE will be) are important in predicting HE course choice, and that task value can comprise both 'intrinsic' and 'utility' value. Intrinsic value is about the quality of the student experience itself. Utility value is the value of a course on the basis of the future utility of that experience, i.e. valuing outcomes like the 'graduate premium'. Another way of conceptualising utility value is to think in terms of the instrumental value of HE study.

Within the academic literature is debate about how the current conditions in the UK HE context frame prospective and actual HE students as consumers. Budd (2016) argues that an increased focus on rankings, marketing and tuition fees has the potential to encourage HE study to be valued in instrumental terms. It has also been suggested that this could lead to a more passive attitude amongst students towards their HE study. It is unfortunate therefore that little empirical research has to date examined this in detail. There is no conclusive evidence to support the notion prospective students are becoming more instrumental or passive in their orientation.

Most of the research that has been undertaken to investigate the extent to which students are instrumentally orientated has been undertaken in the UK. Davies et al. (2013) surveyed nearly 1400 school leavers and reported that:

Even after taking account of differences in motivation towards the choice of undergraduate subject, males and members of certain non-white ethnic groups are more likely to choose 'high wage-premium' subjects. We also find some significant differences between the motivations of different minority ethnic groups. However, students from lower income households are less likely to choose high wage premium subjects, which is a concern for this aspect of policy towards participation in higher education and social mobility.

There have also been qualitative studies, such as those by Budd (2016), Jary & Shah (2009) and Mann (2010), that have found prospective students citing altruistic, intrinsic rationales for studying alongside instrumental ones.

Budd specifically focused on thirteen undergraduates in Germany and the UK from a range of disciplines, whom he interviewed twice. He sought to identify the extent to

which decision making was strategic and or decisions were unconsciously or unthinkingly made. He found evidence of strategising through students' accounts of their decision making, but a desire to achieve financial gain as an outcome of HE study was only cited in two interviews. Perhaps the most notable contribution of Budd's work is that he found evidence of 'non-decision' to embark on HE study, where attending university was an unquestioned matter of course rather than a conscious decision. There are obvious limitations to this study given the sample sizes, but nevertheless it provides qualitative evidence that for certain students "a combination of school, peer, and parental influence contributed to their straightforward transfer from upper secondary to higher education". In these instances the individual prospective HE students' entire milieu was populated by people who intended to embark on HE study or had already done so. In Budd's analysis, students in both Germany and the UK were both "to differing degrees ex- and intrinsically, instrumentally, and altruistically motivated – sometimes all at the same time".

Hemsley-Brown & Oplatka (2015) systematically scrutinised and analysed UK and international research literature from between 1992 and 2013 on HE choice to establish the factors associated with choice. They identified seventy five papers which focused on institutional choice, including: 45 surveys; 13 secondary data studies; one experimental study, two longitudinal studies, 11 qualitative studies and three studies including both qualitative and quantitative techniques. Their review identified over 40 choice factors, of which only a few could be described as 'instrumental' in the sense that they are employment outcome, financial gain or graduate premium orientated. This work supports claims that we made in our previous advisory study, asserting that:

First, higher education is not the same experience for everyone, as Reay et al. (2001) indicated, and the higher education market is not homogenous, although some research studies appear to try to identify a definitive list in what is assumed to be a partly rational process of decision making (despite papers that confirm the decision making is far from technically rational). There is unlikely to be a single list of factors that all students use; there is not a single factor or short-list of factors that will finally provide a definitive answer to why students choose a university. The higher education student market is therefore a segmented market (this might seem to be an unremarkable observation, but the research in the field has rarely acknowledged such a scenario). (Hemsley-Brown & Oplatka, 2015)

The findings of this review also highlighted a preoccupation with demographic factors, particularly socio-economic ones, in HE choice research. Hemsley-Brown & Oplatka suggest that repeatedly researchers have concluded that students from different socio-economic backgrounds make different choices. This systematic review confirmed these findings, highlighting the need for future studies to move beyond this and to seek to provide further insight in order to keep up with changes in prospective students' preferences. They also encourage researchers to recognise that prospective students' choices are not stable, but rather they change over time.

Experimental research in the USA has revealed that prospective students can be encouraged to perceive ‘utility value’ in HE courses which, depending on the individual prospective students’ motivations, can lead to increased course take up. Despite this prospective students will all have varying degrees of interest in pursuing academic study for its ‘intrinsic’ and/or ‘utility’ value, and may well not be cognisant of their own motivations.

This has implications for the information that is provided to prospective students. For example, employment outcome data would be more useful in persuading prospective students, or their parents, about the utility value of pursuing academic study, whereas it tells us little about the likely intrinsic or expectancy value of deciding to embark on HE study in a certain subject or at a certain HE institution. It seems prospective students are focused to differing degrees on the intrinsic, instrumental, and altruistic benefits of HE, and sometimes all of these benefits at once. Consideration therefore needs to be given to the balance of different *types* of information made available to prospective students and whether there is an appropriate range available to meet the varying needs of individuals motivated by a variety of factors.

#### **4.1.5 Student Consumer Protection Laws**

Irrespective of arguments that HE is or should be a free market, students are *de jure* consumers since the introduction of consumer protection laws into HE. Students have consumer rights and in 2015 the Competition and Markets Authority published guidance on consumer law which “formalises student-university relations as regards information provision” (CMA, 2015). This does not mean that students necessarily act as consumers but it highlights that the consumer identity has increasingly been put on students by legal and policy frameworks. Indeed, qualitative research with HE students shows that a “consumer-orientated approach... does not fundamentally capture their perspectives and relationships to higher education” (Tomlinson, 2015).

The CMA report outlines to students that the Consumer Protection from Unfair Trading Regulations 2008 requires that universities give information up front so that an informed decision can be made. They go on to outline what they see as ‘material information’ covering course information (e.g. entry requirements, methods for assessment, location(s) of study) and total course costs, including tuition fees and other extra costs. While these consumer protection laws have been in place for nearly a decade, the legal clarification by CMA in 2015 placed increased emphasis on ensuring that information for students is clear, accurate and accessible. The UK higher education funding bodies published guidance to universities and colleges in 2017 following the decision to transfer responsibility for publishing detailed information on elements like course delivery and costs to providers’ own websites. Anecdotal evidence exists for an increased focus on information quality, but no research into the impact of this change in where information is provided has been found for this update.



A 2017 primary research study for Universities UK (UUK) sought to explore student perceptions of their relationship with their university. Students were found to have high levels of trust in their university, value personal engagement and “expect a different type of relationship with their university; it is distinct from the more traditional, transactional relationship they might have when paying for other types of goods or services” (UUK, 2017).

## 4.2 Key Findings

Any research into choices about higher education, which involves asking individuals about the information they used and decisions that they made, represents a post-hoc rationalisation. Without sufficient self-reflection, individuals themselves may not be very reliable informants about why they adopted certain information search behaviours or made certain choices.

The role of HE information providers should be to support decision making and encourage individuals to be more reflexive and empowered. This can be achieved by challenging habitual behaviours resulting from cultural norms and any automatic thinking processes to ensure that they make the best choice for them. It continues to be essential to recognise the influence of the environment in which choices are framed and decisions made. To achieve this, engaging with people who influence the decisions of prospective students remains key.

New findings highlighted in this chapter are:

- Research by Gale (2017) using Bordieu’s concepts such as ‘cultural capital’ into the retention of students of lower socio-economic backgrounds highlights that there is a specific role information provision can play in reducing attrition through greater understanding of the exit drivers – that student attrition is not always about students being unprepared academically for HE study; rather there are other influences on why students discontinue their studies.
- Building on previous findings that, for students from lower socio-economic groups, elite universities are seen to be “not for people like us”, recent evidence highlights a possible ‘Gold effect’ resulting from the introduction of the TEF Gold/Silver/Bronze system (Trendence, 2017). The specific finding was that 6% of students, higher for BME students at 11%, would have reconsidered applying to their institution, if it was rated Gold. A potential implication of this is that for some prospective students, the idea of a Gold university is “not for the likes of me”.
- Low-SES students in an Australian university were not the most likely to be identified as having the greatest information needs. Groups of students more readily identified as struggling with information skills included those with English as a second language, mature students, those with low prior attainment, international students and ‘at risk’ students (Reading, 2016).

- Research into educational decisions provides evidence that young people who are already best placed to take advantage of information are more likely to do so than those who stand to gain more from doing so (McGuigan et al., 2016).
- Prospective students from lower socio-economic groups typically access fewer sources of information during their decision making process. Furthermore, high ability disadvantaged students tend to lack the information, advice and guidance needed for the application process and lack knowledge of the many parameters involved in the process, which means that “many disadvantaged students may be making sub-optimal decisions on where to apply” (Wyness, 2017, p.10).
- For certain groups, even freely accessible information may be too difficult or costly to access, and so support needs to be carefully tailored and embedded in the curriculum (McGuigan et al., 2016, p.513).
- CFE’s primary research into post-16 choices recommended that special focusing must be given to the information needs of particular groups who experience difficulty in course choice and decision making such as BAME groups and learners with SEN. Moreover, there is a need to support young people and their parents to access and make effective use of IAG in order for them (and their families) to have meaningful careers dialogue that supports their education and career decisions. There is scope for example to trial the provision of information to parents. Similar studies have been trialled in the USA and have proved to have a positive effect on the uptake of STEM courses (Harackiewicz, 2012).
- Building on previous findings that the social influence of institutions (e.g. schools) needs to be recognised, recent research on national factors related to schools in Scotland and in the USA indicates that curriculum plays a role in explaining the gap in social class effects entering top HE institutions – the type of subjects studied had the strongest role. This highlights that earlier education choices can influence decision making around HE choices, and the need to support students as early as possible in making choices about their future education is necessary to remove any potential barriers.
- A recent CFE study amongst students aged 16-19 currently engaged in the post-16 sector in England found that the vast majority consulted with at least one individual for help and support, on average consulting with three individuals (e.g. parents/carers, teachers, friends) and two resources (e.g. UCAS and individual provider websites) (CFE Research & Hughes, 2017).
- Research with prospective HE students found that younger students are more likely to use university visits to inform their decision making than mature students, and regard this as the most useful source of information (Bowes et al., 2015). There was also a clear difference in what elements of information were seen as useful for mature and part-time students, which led to them being likely to use fewer sources of information (Bowes et al., 2015).

- Hemsley-Brown & Oplatka (2015) systematically scrutinised and analysed UK and international research literature from between 1992 and 2013 on HE choice. Their review identified 40 choice factors, but supported the assertion in the 2014 report that there is unlikely to be a single list of factors all students use. The findings of this review also highlighted a preoccupation with demographic factors, particularly socio-economic ones, in HE choice research and repeated conclusions that students from different socio-economic backgrounds make different choices. They highlight the need to seek to provide further insight in order to keep up with changes in prospective students' preferences. They also encourage researchers to recognise that prospective students' choices are not stable, but rather they change over time.

# 5. Sources and Presentation of Information

## 5.0 Chapter Overview

In our previous study we found that prospective HE students use a variety of sources to fulfil their information-seeking needs. In this chapter we consider the sources of information that have become available since the publication of the previous advisory study that have the potential to help inform prospective HE students' decision making. We then consider existing research evidence that has potential to help us anticipate how prospective HE students might engage with such sources of information.

The later part of the chapter explores the role of information and communications technology (ICT) in the provision of information, as well as trends in social media use. It considers how users interact with online information in particular and the potential offered by data visualisation to help reduce the inherent complexity and uncertainty involved in decision making. The chapter concludes by discussing the use of ICT in the provision of information about HE. Where possible we identify insights to inform a future strategy for the provision of information to support prospective HE students and those that advise them.

## 5.1 Sources of Information Used

There has of course been a proliferation of new sources of information about HE made available to prospective HE students in recent years. However two datasets in particular that have been created or updated since our previous study have the potential to be highly influential in prospective students' decision making. These are the Teaching Excellence and Student Outcomes Framework (TEF) in 2017 and the Longitudinal Education Outcomes (LEO) data, which was first released in 2016. There have also been a series of changes to the Unistats website and to the National Student Survey (NSS) following the funding bodies' review of information about learning and teaching and the student experience.

### 5.1.0 LEO Data and Graduate Outcomes Data

A key update to the information which is available to prospective students has been the release of Longitudinal Education Outcomes (LEO) data. The underlying LEO dataset is comprised of linked data drawn from different government departments on tax, benefits and student loans. LEO data is published by the Department for Education (DfE) as official statistics. Using the LEO dataset the DfE publish experimental statistics on employment and earnings of HE graduates by degree

subject studied and university attended. These are intended to provide a more accurate picture of how much UK graduates earn up to 10 years after graduation.<sup>13,14</sup>

The government stressed in the *Success as a Knowledge Economy* White Paper that this type of data is intended to strongly inform student HE choices, is indicative of the commitment to increase the availability of data and is envisioned to complement the TEF awards by allowing comparison across institutions.

By increasing transparency and making better use of public data than ever before, we will shine a light on the employability outcomes of courses and institutions for students to evaluate alongside other considerations... [LEO data is] a valuable source of information for prospective students to have a better picture of the labour market returns likely to result from different institution and course choices. (BIS, 2016, p.58)

Although this data highlights interesting trends in graduate outcomes, some such as Morris (2017) have highlighted a number of caveats to LEO. These include the significance of region (higher gross salaries in the South East likely influence London universities showing higher graduate earnings) and attainment levels on entering university, which are not controlled for. A recent report by the Institute for Fiscal Studies delves further into these issues (Belfield et al., 2018).

The OfS added earnings data from the LEO dataset for English universities and colleges to the Unistats website in July 2018. The LEO data is a substantive, complex dataset. In designing the publication approach, the OfS has carried out work to ensure that what is published is robust and useful to prospective students. This has included testing various presentations of the data with them.

### **5.1.1 TEF and Student Outcomes Data**

The Teaching Excellence and Student Outcomes Framework (TEF) is a national assessment exercise introduced by the government in England. One of its aims is to provide “clear, understandable information to students about where teaching quality is outstanding” (DfE, 2016, p.13). To the extent that student decision making is informed by perceived teaching quality (versus other attributes), this framework is aiming to support students to make better-informed choices, because “poor decisions by the student as to which course and institution to attend can prove costly not just for them but for the broader economy and the taxpayer” (BIS 2016, p.11). However the TEF is intended to act as an institutional motivator, driving quality such as raising esteem for teaching, recognising and rewarding excellent teaching and better meeting the needs of business and industry stakeholders (DfE, 2017a, p.8).

HE providers across the UK can apply for a TEF award, and an independent panel has responsibility for deciding the outcomes of the assessment, which looks at what the provider does in addition to meeting pre-existing national quality requirements.

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<sup>13</sup> <https://www.gov.uk/government/statistics/graduate-outcomes-for-all-subjects-by-university>

<sup>14</sup> <https://wonkhe.com/blogs/a-beginners-guide-to-longitudinal-education-outcomes-leo-data/>

Providers are awarded a rating of Gold, Silver or Bronze depending on whether they are judged to be consistently outstanding, consistently exceeding the required quality, or meeting the requirements, respectively. A Provisional rating can be awarded to providers who meet the requirements but have insufficient data to assess for Gold, Silver or Bronze (DfE, 2017a).

The results from the first year of TEF assessments were announced in June 2017 (TEF Year Two) and the second round in June 2018 (TEF Year Three). A new TEF specification was issued for TEF Year Three.<sup>15</sup> Highlights include the addition of the aforementioned LEO (graduates' salary) data and a new grade inflation metric.<sup>16</sup>

The DfE conducted a 'lessons learned' exercise, from TEF Year Two, gathering feedback from institutions, students and other stakeholders (DfE, 2017b; 2017c). This concluded that the application and awarding process had been fair and transparent, with results generally perceived as credible. However feedback from students has focused on those who were involved in the provider submission rather than how they might use these data.

In February 2018 the Department for Education (DfE) commissioned an evaluation of the Year Two Provider Level TEF. This evaluation was due to gather evidence from HE applicants who applied in 2017-18 for entry during the 2018-19 academic year, who had the opportunity to use TEF to make their choice. UCAS has also been working on a brief 'end of 2017 cycle' analysis report about the impact that TEF may have had on student choices. However these reports were not yet published at the time of writing.

The TEF ratings are currently only available at a provider level, but there is interest in whether or not making this information available at a subject level could be more useful to applicants. Therefore, in March 2018, the DfE invited responses to a technical consultation to inform the development of the TEF at subject level. This consultation ran in parallel to the Year Three Subject Pilot of the scheme involving 50 universities and colleges. This pilot tested how two models produce TEF subject ratings. While the pilot will not result in published ratings for individual higher education providers, the overall findings from the pilot will be published. It states on the OfS website that from 2019-20 the TEF will be assessed and ratings will be published at subject and provider level.<sup>17</sup>

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<sup>15</sup> Teaching Excellence and Student Outcomes Framework Specification  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/658490/Teaching\\_Excellence\\_and\\_Student\\_Outcomes\\_Framework\\_Specification.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/658490/Teaching_Excellence_and_Student_Outcomes_Framework_Specification.pdf)

<sup>16</sup> <https://wonkhe.com/blogs/farewell-tef-hello-teasof-year-3-digested/>

<sup>17</sup> <https://www.officeforstudents.org.uk/advice-and-guidance/teaching/piloting-tef-at-a-subject-level/>

### **5.1.2 How People Deal with Different Sources of Information**

Some initial evaluation of the TEF was commissioned by a consortium of students' unions, based on a survey of 8,994 students studying at 123 different universities. The report by Trendence UK (2017) provides some information about the teaching quality criteria students are interested in. For example, it identified strong support among students for a government-led exercise to encourage excellent teaching, such as the TEF<sup>18</sup>. However the surveyed students suggested that such evidence should encompass a number of factors related to teaching and learning environments that are not currently a feature of the TEF metrics (86% IT, 93% library, 94% course resources) – although these aspects are taken into account in the overall assessment of the provider.

The study also found that 50% of students surveyed would have reconsidered or not applied to their university if they had known it was rated “Bronze”. Furthermore, 11% of students from an ethnic minority background reported that they would have reconsidered applying or not applied to their university if it had been rated Gold, compared with only 5% of white ethnicity students. It is important to note that findings from this study should be treated with some caution, as it was not based on the views of students' who have actually used TEF results to make their HE choices. These findings suggest that the introduction of a grading system has the potential to lead to mixed outcomes, some of which may be undesirable (e.g. a reduction in disadvantaged pupils applying to Gold rated HE institutions).

There is evidence on the use and effects of grading systems which may challenge the proposed impact of the TEF rating system on student decision making. For example, Ubel et al. (2015) discuss the use of labels such as bronze and gold to categorise health plans in the US as potentially having “unintended effects on people’s attitudes toward which plans are best... but the best plan for one enrollee will be different from the best plan for another”. They tested this assumption and found that participants who had a lower than average mathematical ability preferred gold plans, regardless of how the data on price and out of pocket costs was used to determine the categories.

## **5.2 The Role of ICT in Information Provision**

There have been distinct changes in the last four years in accessing information, particularly driven by changes in use of technology but also how information is displayed. We discuss both of these below, along with an outline of the emphasis of consumer protection laws in HE and consequences for information provision.

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<sup>18</sup> OfS commissioned a piece of small scale qualitative research to test a number of messages about the TEF with prospective students, their parents and careers advisers to inform the TEF Year Three outcomes release, with a view to improving understanding of the TEF among these groups. The key findings supported the Trendence report’s observations about what matters most to students and provided some steers about the language which should be used when describing the TEF.

### 5.2.0 User Interactions with Available Information

Technology use amongst young adults remains high, and there have been a number of changes in the way people engage with technology since 2014, particularly mobile technology. While traditional desktop websites are still used for certain browsing behaviours, smartphone use has risen, particularly amongst the 16-24 age group, and research suggests that the smartphone is the most widely used device (overtaking the laptop in 2015) for accessing the internet by adults in the UK (Ofcom, 2016b p.177). More recent ONS figures suggest that 73% of adults now access the internet using a mobile or smartphone, more than double the 36% reported in 2011 (ONS, 2017). There has also been a considerable increase in the proportion of adults who use *only* mobile devices (tablets and smartphones) to go online (Ofcom, 2016a).

Age trends include younger adults being more likely to ‘mostly’ use a smartphone compared with older adults ‘mostly’ using a computer for general surfing or browsing (Ofcom, 2016a; UK Online Measurement (UKOM), 2018), suggesting that mobile browsing is particularly salient for engaging young adults.

In terms of particular online activities, Ofcom (2016a) report that in 2015, 67% of adults (16+) used the internet to find information about work, jobs or studies, a slight decrease since 2013 (compared for example to 81% finding out about leisure activities and 76% about health related issues, both of which have increased since 2013). UKOM (2018) present a more detailed breakdown of the type of online content accessed by UK adults (aged 18+), with over 20,000 unique visitors/viewers of career service websites in March 2018, half of these were via smartphone. Breaking mobile use into ‘share of mobile minutes’, mobile apps are favoured for activities like social media, entertainment and lifestyle, while for career services, automotive, real estate and government it is mobile browsers that take the majority share of mobile minutes (UKOM, 2018).

However, while this trend in increased use of mobile technology exists, caution is needed in the interpretation of its implications. Ensuring that information is accessible online, in particular via mobile devices, is now essential but assuming that this means everyone is comfortable or even ‘skilled’ at using this technology and processing the information it gives access to has been challenged. In 2001, Marc Prensky claimed that the younger generation were ‘digital natives’ and particularly skilled at processing multiple streams of information and using technology. He argued that this demanded a change in teaching methods as students now “process information fundamentally differently” (Prensky, 2001). However a more recent paper in *Teaching and Teacher Education* journal concluded:

...there is no such thing as a digital native who is information-skilled simply because (s)he has never known a world that was not digital.... One of the alleged abilities of students in this generation, the ability to multitask, does not exist. (Kirschner and De Bruyckere, 2017)



### **5.2.1 Trends in Social Media Use**

Among a younger audience, social media is ubiquitous, with 99% of 16–24 year-olds claiming to use social media in 2016 (compared with 64% of UK adults) and almost two thirds of this being done by mobile phone (Ofcom, 2016b, p.181). Ofcom's diary research found that among 16–24s the average time spent on social media per day was 2 hours 26 minutes, compared with 1 hour 16 minutes for all UK adults (Ofcom, 2016b, p.181). However, the unique audience numbers for Google+, Facebook and Twitter declined between 2015 and 2016 (Ofcom, 2016b, p.179), with sites like Instagram and Pinterest gaining unique users over the same period.

The increased use of mobile messaging apps is also notable, allowing communication using text, pictures, video and audio and the ability to set up group conversations. Use of instant messaging services increased from 28% in 2014 to 43% in 2016 among adults (Ofcom, 2016b, p.180). As with social media, use is highest among the younger age group, with 81% of 18–24 year-olds having used Facebook Messenger in April 2016.

There is some evidence that the use of social media has an influence on decision making, although the extent to which this occurs has not yet been identified. Krezel & Krezel (2017) reviewed evidence of the role of the internet on student choice of HE institutions in the context of social influences. They cite a paper (Sojkin, B. et al., 2014) that indicates a decline in the role of peers and an increased role for the internet, social media and peer-to-peer communication. Krezel & Krezel discuss the growth of both these forms of communication and the evidence of their influence:

Social spaces provide effective platforms for prospective students to source and share information, and influence each other's opinions and behaviour (Jeong et al., 2013; Kim & Sin, 2016; McCorkindale et al., 2013). Furthermore, social media spaces facilitate communities that are based on shared interest and which communicate emotions, perceptions and uncertainties. Subsequently, even incidental connections that are formed through social communities have a potential for influencing students (Ellison & Vitak, 2015). (Krezel & Krezel, 2017, p.121)

However, not enough is yet known about how interactions on social media are used to inform or influence decisions. This REA did not focus on the levels of trust placed in social media connections and interactions (the issue of trust in sources of information about HE is discussed in section 5.4). It may be that more use of social media exists, but that the information through this channel is not perceived as trustworthy. This needs further exploration, but the suggestion exists that there is a need to enhance digital literacy in young people and it is recognised as a safeguarding issue.

### **5.2.2 Social Media and Mental Health**

Greater attention has been paid by government to the impact of the internet and social media use on children, with several inquiries since 2017. Evidence generated

by members of our research team, submitted to the Science and Technology Committee inquiry into the impact of social media and screen-use on young people's health, suggests that "spending more time on social networks reduces the happiness that children feel with all aspects of their lives" (Powell, 2018). In particular, the effects for those on lower income were strong, and the largest effects are for happiness with family and school attended. This evidence highlights the importance of understanding and addressing the use of social media in a policy context.

A potentially useful strategic concept to use to explore the opportunities in the 'connected' space, where the physical and digital meet, is the idea of "digital emotional intelligence" (Avery Dennison, 2017). The Avery Dennison Corporation explores several areas where markets can use the connected space to influence (purchasing) decision making, for example using more accurate predictive analytics, personalisation and real-time feedback. Such theories may have potential application in the context of the provision of information about HE.

There has already been increased public conversation around mental health in the UK, with increased awareness and discussion on mental wellbeing also seen within HE. Recent analysis of Higher Education Statistics Agency (HESA) data (Thorley, 2017)<sup>19</sup> shows that five times as many HE students in the UK disclosed a mental health condition in 2015/16 than in 2006/7. Indeed, the *Minding Our Future* report by UUK (2018) calls for action to "improve the links between local NHS services and the support that universities provide" after identifying that gaps in provision exist and this has led to an increase in the impact of mental health, including the number of students dropping out with mental health problems.

### 5.3 The Visualisation of Information

A useful starting point for designing advanced graphical user interfaces is the Visual Information-Seeking Mantra: overview first, zoom and filter, then details on demand. (Schneiderman, 1996: 336).

Data visualisation is not a new idea, but the use of data visualisation applications and the availability of commercial tools to support visual display has grown in the last decade due to increased demand to access and make sense of large datasets. One source values the current 'data visualization applications market' at 4.12 billion US dollars (USD), and estimates growth to 6.99 billion USD by 2022.<sup>20</sup>

This industry primarily exists to support large organisations to interrogate their own data. However, similar applications and design principles are used in public facing information displays such as price comparison websites. A relatively recent development is the challenges facing these comparison websites. The Competition

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<sup>19</sup> <https://www.ippr.org/research/publications/not-by-degrees>

<sup>20</sup> <https://www.reuters.com/brandfeatures/venture-capital/article?id=5123>

and Markets Authority (CMA) announced an investigation of digital comparison tools, including price comparison websites, in autumn 2016. The final report highlighted that while people's attitudes to digital comparison tools (DCTs) were mainly positive, there were concerns about their "transparency, accessibility and clarity about their use of personal information" (CMA, 2017, p.7). The CMA found that the majority of sites "provide useful results... we found some examples where they could be clearer... and a few instances where they appeared to be inaccurate, unclear or possibly misleading" (CMA, 2017, p.8). The report outlines steps by the CMA, companies, regulators and government to enhance the benefits that DCTs offer consumers.

Concerns around the ability of online comparison sites' "ability to deliver fair outcomes" were also raised by the Financial Conduct Authority in 2014. To investigate these, they commissioned primary qualitative research with consumers and published the results in 2014. This research highlighted that consumers welcomed price comparison websites (PCWs) as they were perceived to help complete a potentially difficult task easily and quickly. However, there were differences in how consumers used the tools, and how they interpreted their search results. For example:

The more financially savvy consumers see the PCW as simply a mechanism for displaying a range of products. Many of the less financially savvy do apply a different interpretation to the role of the PCW, as guiding or advising in the way that information is curated and presented. (FCA, 2014)

The report concludes that PCWs could work harder by improving filter options when entering data and improved policy information.

For HE information provision there is a distinct role for a tool or set of tools which allows comparison of key information using data visualisation techniques. However, this research demonstrates that even in an established market such as insurance comparison sites, consumers can find the amount and type of information overwhelming and there is a fine line to balance to ensure that simplification and or visualisation of data is a responsible representation and does not mislead the user.

### **5.3.0 Perceptions of Variability**

When considering how information is visualised, thought needs to be given to how prospective HE applicants perceive variability and distribution of information. Takao Noguchi and Neil Stewart (Noguchi & Stewart, 2018) investigated how evidence is gathered during the process of decision making, particularly when it involves comparing multiple features. Whilst not specifically focused on the context of HE decision making, their contribution builds on evidence from prior decision research and gives insight into how people compare information – which is highly relevant to those making decisions about HE.

In their prior research using eye-tracking software, Noguchi & Stewart revealed that people will look more often at "alternatives which share attribute values with other

alternatives or have similar attribute values”. (Noguchi & Stewart, 2014). Therefore when comparing two potential HE providers or HE study courses, prospective students are likely to focus their attention on HE providers or course choices which share similar attributes, rather than choices that are notably different to one another. In their most recent work (Noguchi & Stewart, 2018) they found that pairs of alternative choices are typically compared on a single dimension. Therefore in the context of decision making about HE, this might involve comparing two courses and two HE providers on the basis of students’ overall satisfaction with a course, rather than multiple factors.

Noguchi and Stewart (2018) also found that, when comparing numerical values, the comparisons that individuals make are magnitude insensitive and small differences in attributes are often ignored. This has implications for the best way to present information about HE study to prospective HE students, not least as many current league table formats invite prospective students to make simple comparisons between a series of numeric variables for each course or institution. The implications are that many prospective students who are comparing data, for example from the National Student Survey or LEO, are likely to be insensitive to small magnitudes of difference. Careful consideration is needed therefore to avoid prospective students overlooking small numerical differences where they may, in reality, indicate a substantial difference (as well as vice versa).

Noguchi & Stewart found that when digesting information on an unfamiliar topic to inform a decision, individuals will have few values to sample from their long-term memory. In such a situation the big three context effects they examined (attraction, compromise and similarity effects) become weaker. The impact of this is potentially great in HE decision making, as many disadvantaged prospective HE students are operating in this “unfamiliar choice domain”, given that in many instances they and their families have no prior knowledge of HE. This means that they are unlikely to have a sense of what a good or bad university score on the NSS would be, or a good or bad staff ratio would be, etc.

## 5.4 Trust

The value of information depends on context as well as timing. It has an *intersubjective* value – that is, it depends on level of trust between provider and user, for example. Therefore the objective value of information – as measured in terms of accuracy, relevance, reliability or recency – is modified by the relationship between provider and user. Research by Slack et al. (2014) offers insights into this issue, contributing to knowledge about preferences for information sources and levels of trust. Drawing on a study on information needs amongst prospective HE students, this article identifies the relative usefulness of various student satisfaction ratings for a group of 1544 prospective students. The top two most useful items are ‘The standard of teaching’ and ‘Their course’. On sources actually used, the most useful are university prospectuses/websites, family/friends and formal university visits.

This study identifies a recurring theme in focus groups with students: they perceive other students, friends and family as offering access to reliable information. Slack et al. (2014) describe these varying perceptions of trust in terms of 'hot', 'cold' and 'warm' information:

The evidence suggests that, for prospective students, talking to existing students is an important part of a university visit, providing 'warm' as opposed to the 'cold' knowledge provided by other aspects of such a visit. However, some students made it clear that they preferred 'hot' knowledge from persons known to them if available:

If you know someone who is at the uni, or lots of students there, it's more helpful. On open days it's not really representative of everyone whereas if you know someone they can be more up front and honest.  
(Karim, Sixth-form College B)

Trust was also investigated via a survey of 1475 applicants on the UCAS system. Gibbs & Dean (2014) found that the most trusted elements of the Key Information Set were:

1. Teaching and assessment methods,
2. Unistats function that permits comparison of courses,
3. Student satisfaction data,
4. Graduate employability and salary data.

In an earlier study, Gibbs (2007) argued that consumers demand trust when they feel vulnerable and ignorant (see evidence cited above on whether students view themselves as consumers – Tomlinson, 2014). Gibbs & Dean (2014) add that

...this applies especially to university entrance because higher education institutes (HEIs) need to help people reach beyond the frontier of what is known to what might be knowable. (p.156)

The study also sought to determine which sources of information students trusted most and which are the most useful. The results for trustworthiness are reproduced in Figure 8. Although social media is popular amongst young people, and its use is still increasing, it is not a trusted source of information about HE. Similarly, although online video sites are increasingly popular, we have found no evidence that prospective students prefer, trust or use videos as a source of information about HE. The main message in relation to trust is that prospective applicants want and trust information 'from the horse's mouth'. This means getting information about the application process from UCAS, and getting information about courses from providers themselves. Amongst secondary sources of information, the most trusted are people already known – family and friends, teachers and advisers, students and staff. Notably, the popular site The Student Room has a relatively low trust rating in

this list which indicates that further exploration of its role in HE decision making is needed given the scale of users.

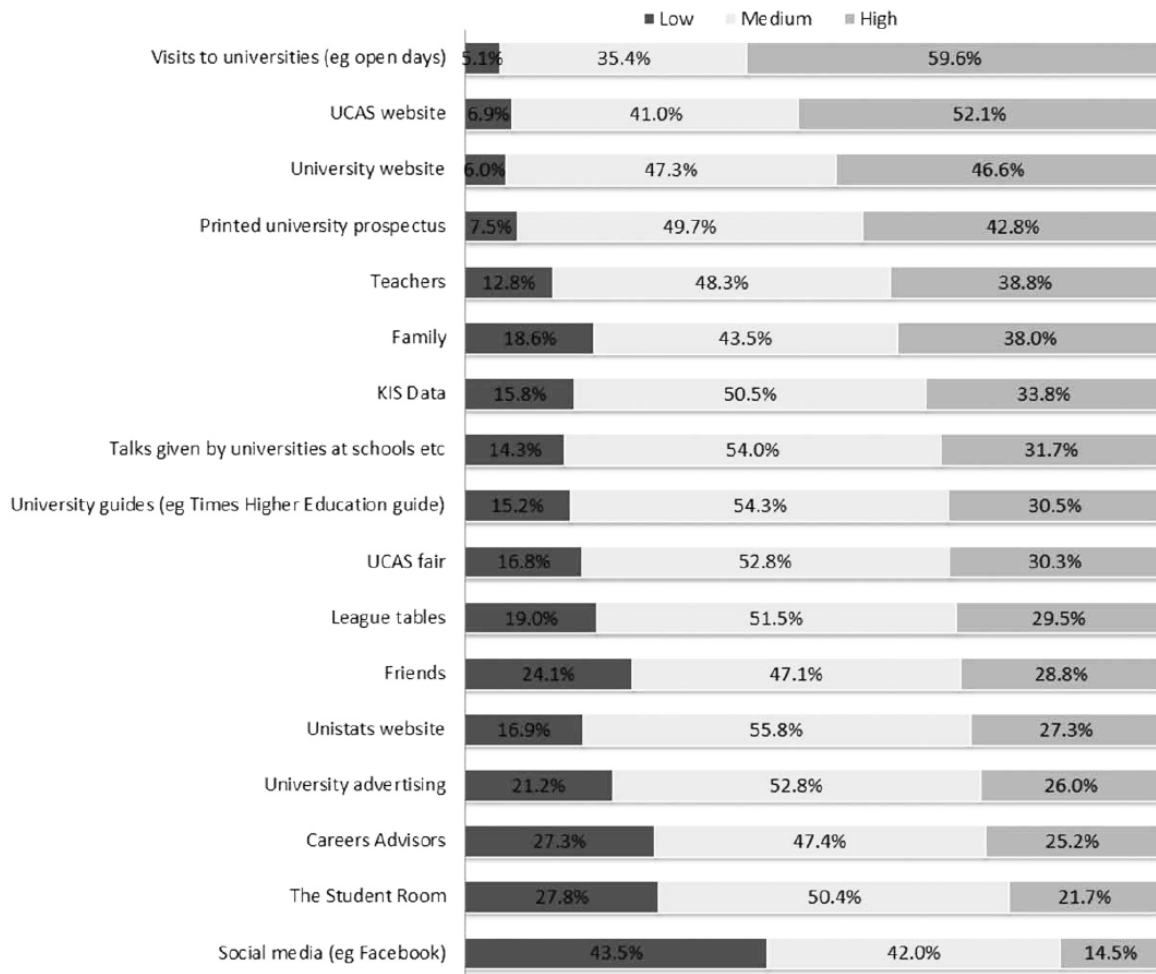


Figure 8: Trustworthiness of sources of information about higher education. (Gibbs & Dean, 2014)

In addition to levels of trust, Gibbs & Dean (2014) also investigated the *importance* of sources of information. Using decision tree analysis, they find that the most important are (in order): university website, UCAS website, printed university prospectus, talk given at a school by a university, and visit to a university. Plotting these results against levels of trust shows how correlated these two measure are, and clearly separates out the various sources into different groups (Figure 9).

To complete this picture and inform the provision of information about HE, further and more up to date exploration is needed of the difference in information behaviour when the source is an official body compared with HE providers or third parties.

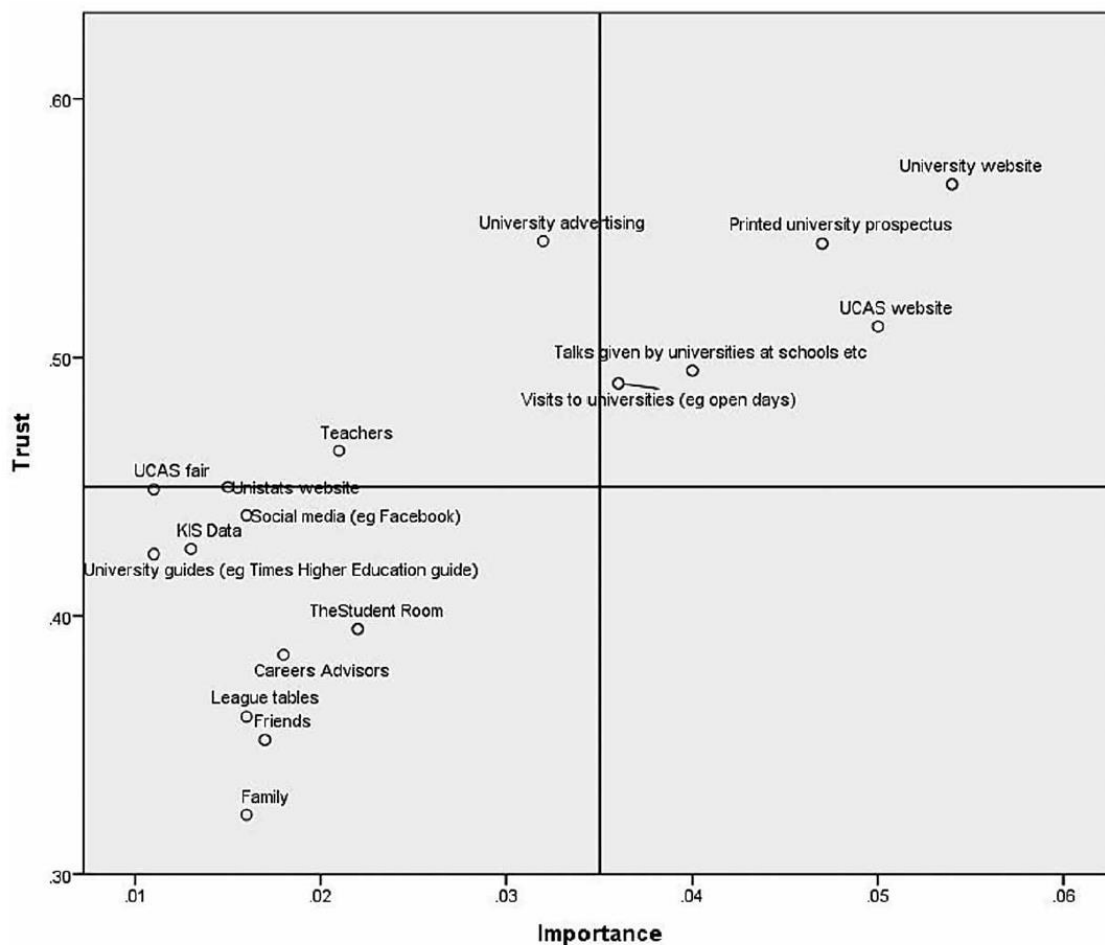


Figure 9: Levels of trust and importance in sources of information about HE. (Gibbs & Dean, 2014, p.166)

## 5.5 Key Findings

In general, across all elements of public policy, there have been further moves to make data open and accessible, and the higher education sector is no exception. However, with open data comes challenges in how to present any caveats or limitations to that data, particularly to those who may have little to no statistical knowledge. The onus is on data providers to ensure that data is presented in a responsible way to minimise misinterpretation.

New findings highlighted in this chapter:

Information has an *intersubjective* value, meaning that it depends on the level of trust between provider and user as well as context and timing. Data about student outcomes, standards of teaching and courses are all deemed to be important, but when it comes to information sources that are actually used, there is still reliance on prospectuses, websites, family and friends, and university visits. The implication is that data provision alone is insufficient, as prospective students who access and use data are unlikely to do so in isolation.

A recurring theme is that prospective students perceive other students, friends and family as offering access to reliable information. Trust is a key issue here. The varying perceptions of trust have been described by Slack et al. (2014), as 'hot', 'cold' and 'warm' information.

Technology trends highlight the increased use of mobile phones to access information available online, particularly for younger people. Primarily, more complex information is accessed via mobile browsing, while mobile apps are favoured for social media, entertainment and lifestyle activities. Making information accessible via mobile phones (e.g. mobile responsive) to reflect current usage and preferences would increase the likelihood of it being used.



## 6. Conclusions and Recommendations

Broadly, the key findings presented in the 2014 Advisory Study have held up. These are outlined in brief below and are followed by new findings from this update.

### 6.1 Conceptual Framework for Understanding Information Behaviour

A theoretical framework for understanding information behaviour in HE was presented in the conclusions of the original report (Figure 10). This framework was a synthesis of the findings, summarising a behavioural approach to understanding HE information use and decision making. As the fundamental findings of the original report have not been challenged by this update, this framework remains a viable and useful summary.

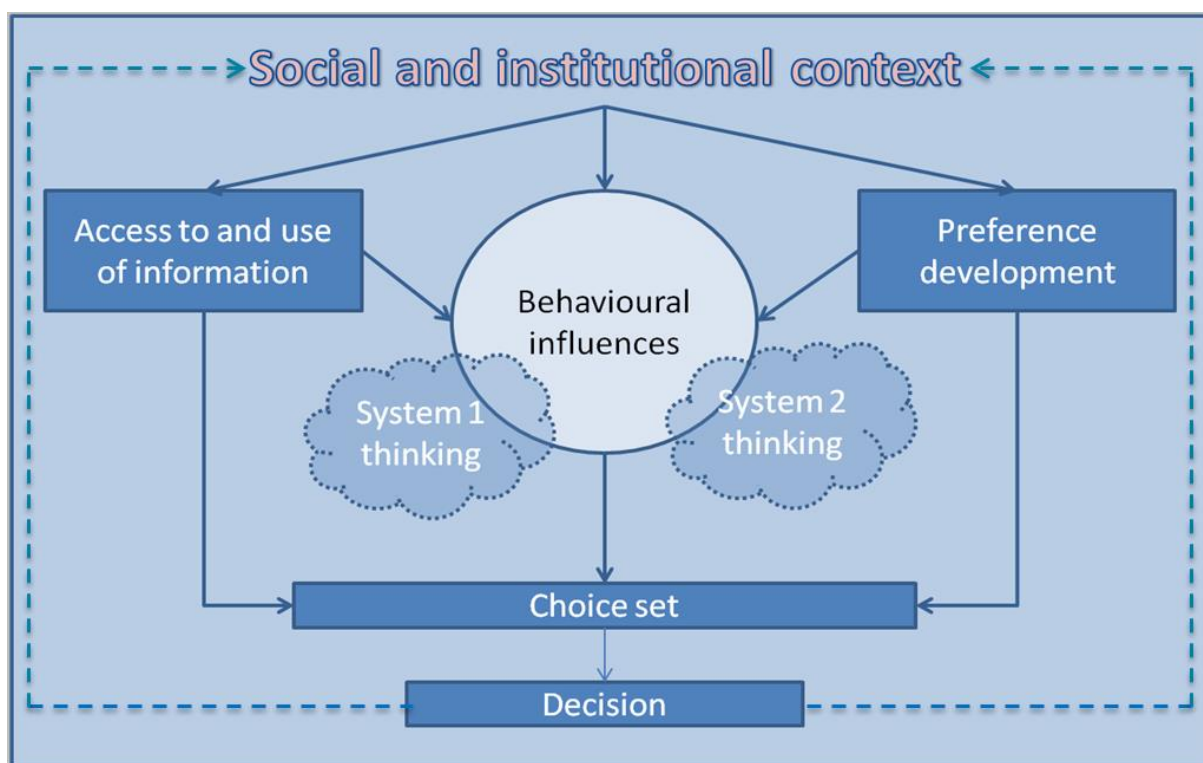


Figure 10: Theoretical framework for conceptualizing information use in higher education.

It shows that not only are behavioural biases influential, but that the outcomes of people's decisions are also informed by the social and institutional context in which they exist. In addition, decisions that individuals make can also influence this context. The reflexive nature of HE information use suggests that adopting a reflexive approach to information provision is necessary.

In this report, we have found further evidence that a successful approach would encourage information users to acknowledge their own biases and internal and external influences, so that they are able to fully understand their own decision making process.

## 6.2 Implications for Providers of Information About Higher Education

Decision making about HE is challenging because the HE system is complex and there are lots of alternatives and attributes to consider; providing information about HE is challenging because people are complex and because their needs, values and goals vary widely.

The Advisory Study put forward evidence that decision making about HE involves less rational consideration than might first be assumed. Therefore, the provision of more information is not necessarily better. This fundamental idea has not changed; more recent evidence also points to the conclusion that student decision making is specific to individual circumstances and there is still a need to tailor information to individual cases.

The Advisory Study offered some principles for the presentation of information about HE. While we have found evidence that builds on the underpinning concepts in recent years, there are no significant changes that would challenge these. We therefore include the original principles in section 7.3 below, with some clarifications.

### 6.2.0 The Limitations of Information Processing and its Effect upon Decision Making

Further evidence has been outlined in this report to support the following key findings from the original report:

- People do not have an unlimited capacity for information processing, therefore can suffer from information overload. (Simon, 1955; Allen & Wilson, 2003)

In conditions of uncertainty and/or when individuals are unsure of which choice to make, they tend to rely on convenient but flawed heuristics (mental shortcuts) rather than on solely rational criteria. These heuristics reduce the burden created by the complex process of searching for and assessing information about higher education options.

- People rarely have access to complete and accurate information, therefore many decisions are not 'rational' or are at least partial. (Simon, 1997)

When attempting complex decision making or challenging problems, 'fast' intuitive thinking (System 1) is more likely to be used but also more likely to be incorrect than 'slow' and deliberate reasoning (System 2). Intuitive thinking does not always lead to poor reasoning, but it is also not infallible – it is often an approximation, rather than an accurate result. Essentially this creates a risk that when faced with complex decisions, people often simplify the decision problem so it can be solved with 'fast' and less cognitive-demanding intuitive thinking (System 1).

Some types of System 1 thinking are both fast and accurate, e.g. expert judgement (master chess players) and visual perception (comparison of size). It is possible to

take advantage of these capabilities by providing support for information literacy (improving information user expertise) and by making use of data visualisation (improving the provision of information).

- In place of or in addition to rational decision making, emotional factors, and non-rational choices often provide the basis for decisions about whether to enter HE and which course or university to attend. (Greenbank, 2009)

Adolescents demonstrate adult levels of cognitive capability earlier than they develop emotional and social maturity. The consequence of this is that although adolescents' are capable of processing complex information to inform their decision making, their lesser emotional and social maturity means that they are more likely than adults to default to social norms or to let peer influence affect their decision making. Therefore the provision of information alone is not enough; efforts also need to be directed at counterbalancing peer influence and social norms, where they might lead to suboptimal decision making for that particular prospective student.

### **6.2.1 Social and Psychological Factors Play a Central Role in Information Behaviour and Decision Making**

A key finding in the original report was the need for HE information providers to engage with those who influence the decisions of prospective students, because of the central role that social factors play. It was also acknowledged that the environment in which decisions are made is an important consideration.

The original report concluded that:

- Activity relating to the acquisition and use of information is influenced by a range of factors including personal and psychological traits, as well as social and environmental conditions. (Case, 2012)
- The influences of the key people and the institutions engaged with are particularly significant in forming information-seeking behaviour and decision making (Reay et al., 2005)

Building on these findings, this report outlines further evidence on the influence of individual backgrounds and environments. The same information is likely to be processed differently by individual prospective students. 'Information initiatives' have the potential to affect course selection and improve prospective students' future occupational prospects. However messages conveyed can be processed differently according to socio-economic status, specific sets of preferences, opportunities and constraints. While there is an evidence gap with regard to how lower socio-economic groups engage with information, we know that they typically consult fewer sources of information.

Furthermore, it is increasingly apparent that there is a 'not for people like us' effect. For example, some students would have reconsidered applying to their institution if it was rated Gold, suggesting certain groups of students are more likely to be deterred by a Gold rating. This warrants further investigation to ensure the new

grading system (for TEF) does not disadvantage any prospective students, particularly those from lower socio-economic or disadvantaged backgrounds.

An important update to the original report is to note that social media use is now universal amongst 16-24 year olds, and two thirds of the adult population use it weekly. However, while research shows that social media does play an influential role in decision making, there is little robust evidence as to the extent of this. What is known, is that social media is the least likely source to be trusted, and it is notable that there is a growing evidence base that social media has a negative impact on mental health. Therefore use of social media, particularly as a primary mode of communication or dissemination of information to prospective students, should only be pursued with caution, as without a high level of trust the impact of information will be minimal.

Existing evidence suggests that both ‘expectancy’, (how confident the prospective student is about their potential success in HE) and ‘task value’ (how useful or enjoyable the prospective student perceives HE will be) are important in predicting course choice. Task value can comprise both ‘intrinsic’ and ‘utility’ value, with intrinsic value relating to the student experience and enjoyment, and utility value meaning the instrumental value of HE study, e.g. potential graduate employment outcomes and earnings. With an increasing emphasis on students as consumers there has been a great deal of interest in whether this is leading prospective HE students to value HE in more instrumental, rather than intrinsic, terms. However there has been very little empirical work to date to test this theory.

Experimental research has revealed that prospective students can be encouraged to perceive greater utility value in courses, which depending on the individual prospective students’ motivations, can lead to increased course take up. Despite this prospective students will all have varying degrees of interest in pursuing academic study for its ‘intrinsic’ and/or ‘utility’ value, and may well not be cognisant of their own motivations. This has implications for the information that is provided to prospective students. For example, employment outcome data is only useful in persuading prospective students, or their parents, about the utility value of pursuing academic study; it tells us little about the likely intrinsic or expectancy value of that decision.

### **6.2.2 The Role of HE information Providers Should Be to Support Decision Making and Empower People to Make Better Choices for Themselves**

In the context of HE choice, seeking to nudge prospective students to a particular HE choice is largely inappropriate because what might be considered a ‘best’ outcome for one person may be not be optimal for another. Schools and higher education information providers do have a responsibility to support prospective students to make more informed decisions and choices that satisfy their own needs, by making people more aware of their own tendencies, preferences and biases. Given the significance of parental influence, there appears to be merit in testing whether the

provision of information that encourages meaningful careers dialogue about entering HE could be effective when provided to the parents of prospective HE students. Similar studies have been trialled in the USA and have proved to have a positive effect on the uptake of STEM courses (Harackiewicz et al., 2012).

### **6.2.3 Decision Making Can Be a Very Personal Activity and HE Information Providers Should Work toward Tailoring Information Provision to Individual Cases**

As previously outlined, the idea that prospective students are homogeneous has fallen out of favour, and it is now acknowledged that HE decision making is specific to individual circumstances. The implications of this being that HE should be tailored to individual cases and should take account of the use of a variety of sources and employment of a variety of methods to reduce complexity and uncertainty involved in HE decision making.

This update outlines further evidence from recent research of the need to tailor to individual needs. Despite there being no single solution for the right information, there is however a need for information about destinations and graduate outcomes for particular sub-groups of students, most notably part-time students. This should match the current provision of information about full-time students.

In 2016 the UK HE funding bodies in England, Scotland, Wales and Northern Ireland provided a summary of responses<sup>21</sup> to the consultation on changes to the NSS, Unistats and information provided by institutions. This document outlining the intended approach to the provision of information sources to support the student decision journey already recognised that there are no typical student journeys and that the decision making process is rarely linear.

The OfS's approach will aim to ensure that information is presented in a way that allows students to find information relating to their own information needs. Rather than assuming one set of data will be important to all students, this approach recognises a diversity of information needs and ways of valuing HE. Therefore any distinctive needs of part-time and mature students and those without a HE background will be accounted for.

Whilst it is true that disadvantaged students are more likely to have greater needs for support with using information, 'disadvantage' is not the same as 'lacking information skills' or 'having issues with accessing/processing information'. 'Information skills' and 'information literacy' are useful terms (Reading, 2016). Support with information skills could be effectively provided alongside courses of study, and can be delivered via peer learning methods, as with support for academic writing skills.

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<sup>21</sup> <http://www.hefce.ac.uk/pubs/Year/2016/201615/>

Research for DfE by CFE, including a survey amongst students aged 16–19 currently engaged in the post-16 sector, offers the following insights for providers of information about HE:

- The vast majority of students consult with at least one person for help and support, on average consulting with three people (e.g. parents/carers, teachers, friends) and two resources (e.g. UCAS and individual provider websites) (CFE Research & Hughes);
- While the majority of students find it easy to decide which post-16/post-18 course to apply for, BAME students and those with SEN are more likely to find decision making difficult and to need more support and guidance as a result (CFE Research & Hughes);
- Younger students are more likely to use university visits to inform their decision making than mature students, and regard this as the most useful source of information (Bowes, et al., 2015);
- Mature and part-time students attach greater importance to information on the costs of HE. Mode and location of study are often key considerations for mature and part-time students, and those with family and/or work commitments in particular. These factors can constrain choices and reduce the need to compare a wide range of courses and/or institutions in order to narrow down the options available (Bowes, et al., 2015); and
- Students from families with no prior HE experience also placed greater importance on the costs of HE and practical considerations such as travel and accommodation (Bowes, et al., 2015).

Having provided these findings it is vital to note that systematic reviews of existing evidence have not identified a single factor or shortlist of factors that will definitively answer why a prospective student might choose one HE provider over another.

There is some recent evidence to suggest that grading systems may have unintended differential effects for certain sub-groups of prospective students, including those from ethnic minority backgrounds or with a lower than average mathematical ability, for example. It is also important to acknowledge that providing a grading system for one aspect that affects HE choice behaviour creates the potential for trade-offs with other attributes, particularly if not graded in a comparable way. This is a problem if the goal is to help prospective students make optimal decisions for themselves on the basis of multiple criteria.

#### **6.2.4 Providers of HE Information Should Be Mindful of the Complex and Dynamic Nature of Information Seeking**

The wider evidence on information seeking, both in the original Advisory Study and in this update, highlights that it is dynamic, rarely simple, and that accessing and using more sources does not always result in a decision being made or a reduction of uncertainty. Previously, a key finding stated:

- In situations where there is an overwhelming amount of data, the need for practical and reliable ways of reducing the information-processing task becomes ever more important.

Data visualisation can reduce the cognitive load experienced when individuals try to process large amounts of information. New evidence suggests we are better at finding patterns in visual information than in numerical data; it involves less cognitive load, is quicker, more accurate and more reliable. Therefore, use of visualisation tools and techniques should be explored, but evidence suggesting that the over-simplification of datasets can be misleading must also be borne in mind.

Lessons from the recent attention on price comparison websites show that the presentation of complex information can be problematic, with different people interpreting data in multiple ways. Primary research found that consumers were overwhelmed by the amount and type of information, and that using a comparison website did not always lead to 'fairer outcomes'. The potential for misleading information seems to be increased when complex information is simplified and therefore while it seems desirable to support users through complex information, it is a fine line to balance to ensure information is presented responsibly as well as accessibly.

The outcomes of the review found that the primary role of any future resource to replace Unistats will remain to support student decision making about study but it will have a single strong brand for promotion (rather than the previous multiple brands of Unistats and Key Information Set). The OfS has an ambition to make it easier to understand and interpret data comparisons. The OfS are developing a strategy to provide information, rather than just data, and a greater degree of contextualisation and explanation about the data that they publish. This 'contextualisation' will ensure that prospective students understand how to interpret the data that is published and what it may tell them (as well as what it cannot tell them). The OfS is also seeking a way to make it easier to understand the effect of survey response rates and sample sizes in comparing data, in a straightforward, easy-to-understand way.

The responsibility for the publication of detailed course information now lies with HE providers, in line with the CMA guidance. Specifically, this means the learning, teaching, assessment, fees and accommodation elements. The conclusion was reached that such information is better presented on institutions' websites, with help for students to navigate it from a central source. Additional advice for institutions may be forthcoming in the future from the OfS to help ensure the level of consistency and detail that is helpful is achieved.

Our understanding of information behaviour suggests that a spectrum exists, from 'maximisers' who can never get enough information to 'satisficers' whose information needs are satisfied more easily, i.e. as soon as there is sufficient to make a decision. A recent primary research on information use in HE decision making identified three types of decision-makers: satisficers, optimisers and pragmatists (McGrath, 2018). While these are a tentative finding from a single study, there seems merit in creating

typologies to help guide those providing information on HE to get closer to an effective system which caters for all types of information user.

The difference in information needs on the spectrum of maximiser–satisficer is largely a matter of the *quantity* of information. The difference in information needs on the intrinsic–utility spectrum is more a matter of the *types* of information. These two concepts provide the ability to ‘map’ the information needs of different groups of prospective students so they can be better understood and served.

### **6.3 Potential Areas for Future Research**

This update focused on publications since 2014 to provide an update to the previous literature review known as the Advisory Study. It therefore reflects the most up to date research about decision making and information behaviour. It continues to be the case that there remain large knowledge gaps that would benefit from further research, summarised here.

**Patterns of information behaviour in HE:** As highlighted previously, there is no one-size-fits-all approach to the provision of information in HE so there continues to be a need for primary research to map information behaviour for specific information needs. As yet, no evidence has been found which identifies exactly when information overload occurs when processing information about HE, what biases or heuristics play a role in this particular decision making context or how these might differ between types of information users or stages of the decision making process.

**A reflexive approach to decision making for HE:** Evidence from other contexts, and those studies on HE highlighted in this report, suggest that a more behaviourally informed approach to information provision might improve the process for prospective students. Experimental research on different approaches would build a stronger evidence base to support information providers to develop their services.

**Effectiveness of data visualisation and use of technology for presenting and disseminating information about HE:** Evidence suggests that data visualisation techniques have the potential to reduce a person’s cognitive load, and that with increased amounts of data available to support HE decision making this should be considered. However, there is a lack of evidence about its effectiveness in the context of HE information provision. With findings highlighted in this report showing there is potential for information to be misleading when complex information is simplified then this is an important area for future research. Research into the use of technology-mediated interactions is also scarce, so the potential this may have in supporting bespoke, relevant information to individuals needs would be valuable.



## 6.4 Principles for Information Provision in Higher Education

Below we outline the principles created in the 2014 Advisory Study. This REA has found no evidence to support a fundamental change in any of the principles, but some points of clarification or minor amendments were needed. These are included below.

Principle 1	
<p><b>Preferences are often partially-formed and endogenous to social and economic context, and people are rarely fully-informed utility-maximisers.</b></p>	<p>The preferences of prospective HE students are not fully formed as they seek information and make decisions. They are influenced by a wide variety of both personal traits and social and institutional environments. An individual’s own curiosity provokes a reflective examination of preferences.</p>
Principle 2	
<p><b>People (information users) behave <i>as if</i> they have two different brain systems. System 1 is automatic and quick, but fallible. System 2 is deliberate and slow, but more accurate.</b></p>	<p>Much of the current focus of information provision relies on people overcoming their ‘System 1’ thinking in order to allow for an optimal consideration of participation in HE. However, decisions influenced by ‘System 1’ can lead to good outcomes for prospective students; since System 1 is responsible for affective or intuitive responses these might be the best way of someone getting a ‘feel’ for whether something is right for them.</p> <p><b>To clarify:</b> System 1 is used if there isn’t time, when there is uncertainty and/or there is too much information to process. It is quicker but not infallible – it is often an approximation, rather than an accurate result. There is no evidence that one ‘system’ happens before another (the ‘systems’ are not real, they are just metaphors).</p>
Principle 3	
<p><b>There is heterogeneity across people’s decision making arising both from individual psychological traits and their socio-economic and cultural backgrounds.</b></p>	<p>Decision making is a process borne out of context. It is embedded in an individual’s cultural and socio-economic background, and the situated nature of their understanding of a piece of information.</p>

#### Principle 4

**It should not be assumed that people can effectively process increasing amounts of information; more information on a subject does not always lead that person to be more informed.**

The concept of bounded rationality implies that people have a limit to the amount of information they can process. Therefore, effective and informed providers of information are adept at challenging the assumption that 'more information always leads to more informed people'. The right information for the right person will lead to more satisfactory outcomes for that person.

#### Principle 5

**Irrespective of the volume of information available, people will make their own judgements as to whether they are informed enough to make satisfactory decisions.**

Adaptable information provision focuses on understanding what information is salient to which people. Behavioural science shows that some people ('maximisers') may not undertake exhaustive searches for information before making decisions. Furthermore, people who might be considered 'satisficers' (those who settle for a 'good enough' choice, without worrying whether there might be a better option available) are more likely to be satisfied with their decision than maximisers. Therefore, evaluating decisions on the basis of satisfaction and in terms of the person's needs and goals can be preferable to evaluations on the basis of simply assessing what information is available.

#### Principle 6

**Information itself can lead people to reassess their current level of understanding about a specific subject.**

Information seeking is dynamic, and the nature and requirement of people's searching, whether it is for decisions about university attendance, which are inherently complex and uncertain, or for more straightforward requirements, can lead to other questions or problems arising. As a result, whether a need is satisfied is not a simple process of understanding.

#### Principle 7

**There is no 'one size fits all' solution to information provision.**

The psychological traits of an individual, and the social and institutional context in which they find themselves, all impact on how and why information is used. Whether a piece of information is salient to that person is specific to their personal outcomes, preferred goals and life-experiences. As such, there is no one overarching solution to information provision.

## Principle 8

**Too much information can lead to cognitive overload, or an emotional inability to make satisfactory decisions.**

Too much information can lead people to disengage effectively with the information-seeking process. It is challenging to identify the point at which the amount of information becomes too much, made more difficult by the fact that people have different capacities for information-processing and because the difficulty of decision making will also vary.

People may not recognise when their own information seeking has resulted in too much information to process. Furthermore, being presented with too many choices can lead to decision making 'paralysis' which inhibits the ability to reach a satisfactory outcome. These demotivating conditions occur due to a feeling of helplessness and a lack of control when faced with a task that is too complex and/or too time-consuming to process.

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# List of Abbreviations

BIS	Department for Business, Innovation and Skills
BIT	Behavioural Insights Team
BME	Black and Minority Ethnic
CMA	Competition and Markets Authority
COM-B	a model of behaviour change (capability, opportunity, motivation, behaviour)
DCT	digital comparison tool
DfE	Department for Education
DLHE	Destination of Leavers from Higher Education survey
FEC	further education college
HE	higher education
HEFCE	the Higher Education Funding Council for England
HESA	Higher Education Statistics Agency
IAG	information, advice and guidance
ICT	information and communications technology
IPPR	
LEO	Longitudinal Education Outcomes
MINDSPACE	report by Dolan <i>et al.</i> (2010); an acronym for a collection of principles from behavioural psychology
NCOP	National Collaborative Outreach Programme
NDM	naturalistic decision making
NSS	National Student Survey
NUS	National Union of Students
OfS	Office for Students
PCW	price comparison website

REA	rapid evidence assessment, a method for literature review
SEN	special educational needs
STEM	Science, Technology, Engineering and Mathematics
TEF	Teaching Excellence and Student Outcomes Framework
UCAS	Universities and Colleges Admissions Service
UKOM	UK Online Measurement
UUK	Universities UK

# Appendix 1: Literature Search Terms

Table 1 lists the key terms used for the literature search.

Primary Search Terms	Key words / associated terms
Information	
Sources of Information	Friends / peers
	Parents / family
	Teachers and careers advisors
	Key Information Sets (KIS)
	UCAS directories and guides
	University prospectuses, websites, open days
	REF / TEF / KEF
	UNISTATS
	Longitudinal Education Outcomes (LEO) data / employability data
	Graduate outcomes [data]
	DLHE / Longitudinal DLHE
	Student sources of information / National Student Survey (NSS) / student feedback / student survey[s] / student voice
	Other publicly-available sources of information: newspapers, league tables
Higher education	Course information
	Competition / choice
	Cost / returns / value for money / investment / fees / maintenance / living costs / loan / bursary / finance
	Marketisation [of HE] / students as consumers
	Performance measurement
	Advertising / promotion / marketing
Information behaviour	Information seeking
	Information searching
	Judgement / choice / decision making
	Information anxiety / cognitive load
	[Comparing] alternatives / attributes
	Comparability / comparison [websites]
	Uncertainty
	Reflection on choices / satisfaction
Presentation of information	Modes of delivery
	Information provision
	Information architecture
	Developing and using filters / selection criteria
	Targeting users
	Data visualisation
	Open source / open data / 3rd-party / restricted access

	Formats of information: text, brochure, webpage, data spreadsheet, PDF, video, streaming, webchat, chart, etc.
Information and advice and guidance	Careers information, advice and guidance (IAG) / careers counselling
<b>Behaviour science and other relevant fields</b>	
Use of websites	Accessibility
	Search terms and building awareness
	Usability
Behavioural psychology	Customer behaviour
	User-centred design
	Information evaluation
Cognitive psychology	User satisfaction
	Information processing
Behavioural economics	Cognitive load
	Behavioural effects, cognitive biases, etc.
Economics	Heuristics ('rules of thumb')
	Models of behaviour
Sociology	Understanding market behaviour
Information users	Social capital / cultural capital
	Disadvantaged [students/young people]
	[Low] socio-economic status
	Disability
	Mature students
	Part-time students
	First in family / parents with no experience of HE
<b>Technology</b>	
Societal or cultural transformations	Patterns in use of technology
	Effects of technology [psychological, social, ...]
Technology tools and the application of new technology	[Effective] communication channels
	Apps and smartphone technology
	E-government agenda and data-driven public services
	Online resources (e.g. Which? University)
	Innovations / trends / future directions
	Open data tools
	Social media (inc. Student room, Facebook, Twitter etc)
	User generated content
	Data protection / information security / privacy / rights

Table 1: Key search terms for literature review phase of the Advisory Study