

Research report
November 2014

Our minds at work

Developing the behavioural science of HR



WORK



WORKFORCE



WORKPLACE

Championing better work and working lives

The CIPD's purpose is to **champion better work and working lives** by improving practices in people and organisation development, for the benefit of individuals, businesses, economies and society. Our research work plays a critical role – providing the content and credibility for us to drive practice, raise standards and offer advice, guidance and practical support to the profession. Our research also informs our advocacy and engagement with policy-makers and other opinion-formers on behalf of the profession we represent.

To increase our impact, in service of our purpose, we're focusing our research agenda on three core themes: the future of **work**, the diverse and changing nature of the **workforce**, and the culture and organisation of the **workplace**.

WORK

Our focus on work includes what work is and where, when and how work takes place, as well as trends and changes in skills and job needs, changing career patterns, global mobility, technological developments and new ways of working.



WORKFORCE

Our focus on the workforce includes demographics, generational shifts, attitudes and expectations, the changing skills base and trends in learning and education.

WORKPLACE

Our focus on the workplace includes how organisations are evolving and adapting, understanding of culture, trust and engagement, and how people are best organised, developed, managed, motivated and rewarded to perform at their best.

About us

The CIPD is the professional body for HR and people development. We have over 130,000 members internationally – working in HR, learning and development, people management and consulting across private businesses and organisations in the public and voluntary sectors. We are an independent and not-for-profit organisation, guided in our work by the evidence and the front-line experience of our members.

Our minds at work

Developing the behavioural science of HR

Contents

Acknowledgements	1
Foreword	2
Executive summary	3
1 New perspectives for higher impact HR	6
2 What insights does behavioural science give us?	9
3 Applications: how can HR benefit?	12
4 How much should we rely on behavioural science?	17
Next steps: forthcoming CIPD research on behavioural science	19
References	20

Acknowledgements

This report was written by Jonny Gifford, research adviser at the CIPD.

Foreword

‘We need to make sure HR strategies and interventions are in sync with how people are “wired” and don’t inadvertently encourage undesirable behaviour.’

This report sets out the case for applying a behavioural science lens to a wide range of HR issues. Understanding human behaviour at work lies at the heart of HR. We need to make sure HR strategies and interventions are in sync with how people are ‘wired’ and don’t inadvertently encourage undesirable behaviour. It is easy for the thinking behind HR activity to be narrow and not consider the organisation systemically.

Building on the series of reports we have published on behavioural science insights for learning and development, this report makes the case for applying behavioural science to HR practice more widely. While some leading-edge consultants and practitioners are already doing this, it is far from normal practice. And yet it has a natural fit with the ‘USP’ of HR: a focus on shaping human behaviour at work for both the good of employees and business needs.

Behavioural science in a work context is not just about ‘nudging’ employees in the right direction, any more than it is just about fMRI brain scans. More broadly, it builds understanding of how people psychologically react and behaviourally respond to interventions, environments and stimuli. It can help us create management systems that get the best out of our people: to develop reward systems that genuinely incentivise employees; to go about the perennially difficult task of performance management; to work smarter and more effectively in our roles.

The Behavioural Insights Team set up by the UK Cabinet Office in 2010 achieved tangible success in using behavioural science research for a more effective implementation of government policy. We believe that employers should follow suit in this, as they can reap similar rewards in building a more evidence-based understanding of what influences our thinking and behaviour at work. We also believe that HR should lead the way, as it is without doubt the function best placed to gauge, understand and shape organisational culture and behaviour.

Scientific understanding within the broad field of behavioural science has come on in leaps and bounds over recent years, but the world of people management, leadership and L&D has been slow to take note of the opportunity that this presents. It is high time that that changed.

Jonny Gifford
CIPD

Executive summary

New perspectives for higher impact HR

HR constantly straddles the worlds of people and business and needs to understand both. At its best, it develops a full appreciation of the individual, political and cultural factors that determine ‘what really goes on around here’ and, at the same time, is ‘business savvy’ and aligns the architecture of people management with strategic and operational imperatives.

Behavioural science is a relatively new field that draws in particular on behavioural economics, cognitive psychology and social neuroscience. It offers an ever growing array of compelling insights into how our minds work. Many of these have direct relevance to key HR issues, such as recruitment, people management, learning and development and organisational change.

What’s more, many behavioural science insights run counter to received wisdom and common practice. As such, they can dispel misconceptions about what drives performance and human behaviour at work. Drawing on behavioural science can help us challenge misguided interventions or even flaws in the basic set-up of people management in our organisations.

What does behavioural science tell us?

Behavioural science research is often heavily contextualised as it looks at specific situations,

but more general insights and conclusions can be drawn.

One main area of decision-making research, ‘dual process theory’, shows how we use intuition or automatic thinking (dubbed System 1) and reflective, deliberate thinking (System 2). For example, while System 1 thought has inbuilt weaknesses – such as bias, post-hoc rationalisation and unhelpful habits – it is also an invaluable and underused resource, helping us draw on our expertise to make swift accurate judgements.

Behavioural science also sheds light on how we respond to threat and reward, how we respond to policies and what contributes to our happiness. For example, we learn that we are hardwired to be driven by the reward of social acceptance and the threat of exclusion.

Applications: how can HR benefit?

To date, the CIPD’s research on behavioural science has broadly focused on the area of learning and development. In this report, we argue that behavioural science should be applied to HR much more widely. How our minds work is not a niche interest; it is of wide relevance to many, if not all, aspects of workplace behaviour and performance.

We consider a number of areas of HR that can benefit from a behavioural science lens. Particular examples we highlight include:

‘Many behavioural science insights run counter to received wisdom and common practice.’

- **Selection and recruitment.** Understanding the strengths and weaknesses of intuition in decision-making can help recruiting managers draw on their expertise more effectively and, at the same time, avoid falling prey to unconscious bias.
- **Pay and reward.** As well as highlighting the social nature of threat and reward, behavioural science research shows that financial reward is not the straightforward motivator that we often assume it is. An understanding of these factors gives a basis for more effective remuneration and reward systems.
- **Performance management.** Personal criticism and feedback are not the productive forces of motivation that we often assume they are. Behavioural science can shed light on these processes and what, for instance, helps and hinders productive performance conversations.
- **Personal effectiveness and smarter working.** Neuroscience highlights that we are essentially ill-equipped as humans to cope with an ever more fast-paced and fragmented world of work. Taking note of our limited ability to multi-task, on the one hand, and how we can increase our mental capacity, on the other hand, can help us become more effective as individuals.
- **Ethical behaviour.** As shown by the economic crisis, reward systems can create perverse incentives that undermine professional ethics. Behavioural science can be used to create systems that shape ethical behaviour in a positive way – for example, by ‘nudging’ with mental reminders about the consequences or core purpose of an activity.
- **Employee engagement.** As well as the subject of what motivates us at work behavioural science can help us understand factors such as how we form attachments to organisations as social entities. By creating positive systems, it can also be used to encourage management behaviours that are known to foster employee engagement.
- **Workplace environments.** The nature of our physical environments can influence us in many ways, even including how honestly we behave. Understanding such factors can help us to create workplaces that are more conducive to creativity, collaboration, efficiency and ethical behaviour.
- **Organisational change programmes.** Behavioural science explains how resistance to organisational change is a natural reaction. Equally, it provides practically useful insights into how we can foster a change-ready mindset and how seemingly die-hard habits are malleable and can be replaced.
- **Team-building and project working.** Psychometric tools can help allocate employees appropriate roles and inform team composition. Behavioural science also gives us insight into the methods by which we can develop effective teams – for example, by emphasising the social interaction and collaboration.
- **Interpersonal conflict.** The experience of social conflict represents a deeply threatening internal crisis that can even affect basic cognitive faculties such as intelligence. Understanding this, as well as the huge cognitive ‘rewards’ of resolution, can guide us in developing effective solutions that are less adversarial, such as mediation.
- **Equality and inclusion.** Unconscious bias has become a staple application of behavioural science in an employment context. We instinctively look for similarities between ourselves and others and are primed to quickly judge ‘outsiders’. One solution may be to foster ‘belongingness’ by emphasising the positive opportunity to build relationships across difference.
- **Well-being and stress.** Neuroscience shows how our visceral reaction to stress can hijack our rational minds. On the other hand, moderate levels of stress create a healthy tension and help us perform. Behavioural science also gives us practical clues on how to develop well-being at work, for example by building our sense of competence and autonomy.

How much should we rely on behavioural science?

Behavioural science has been criticised on various grounds. Most seriously, perhaps, is the accusation that the ‘nudge’ theory of Thaler and Sunstein generates manipulative, surreptitious and ethically questionable interventions. Behavioural science is not just a question of shaping behaviour by influencing people in the choices they make; it is also about creating optimum conditions for effective thinking and increasing our satisfaction and well-being. But even where it is fairly described as nudging, we side with the argument that this can be justified depending on the outcomes.

Another criticism portrays behavioural science as a faddish pseudo-science. Here, detractors

point to glib assertions, such as that we use only 10% of our brains. Others argue that neuroscience is hugely expensive considering the relatively small benefits it brings. In both these cases, we argue that the criticisms do not detract from the genuine value that behavioural science offers.

Nonetheless, we acknowledge that behavioural science is not the end of the story. We need to take a selective, careful approach, weighing up different types of evidence – for example, that which comes from both controlled experimental research and observational field research. We also need to integrate behavioural science insights with our practical experience and the organisational evidence we see before us.

Behavioural science offers no panacea. But we should not ignore its value for understanding human behaviour at work and delivering higher impact HR. Nor should we shy away from making bold decisions, based on quality behavioural science evidence, on how we organise work and manage people.

‘Behavioural science is not just a question of shaping behaviour... it is also about creating optimum conditions for effective thinking.’

1 New perspectives for higher impact HR

‘At its best, HR activity is rooted in an understanding of both the people and the business of the organisation.’

HR and L&D are inherently behavioural

HR is a field of practice that is inseparable from organisational behaviour and systems. At its best, HR activity is rooted in an understanding of both the people and the business of the organisation. It develops a full appreciation of the individual, political and cultural factors that determine ‘what really goes on around here’ and, at the same time, is ‘business savvy’ and aligns the architecture of people management with strategic and operational imperatives (Sears 2010, CIPD 2012).

Criticisms of HR functions often focus on them being overly process driven (CIPD 2013a, Hirsh et al 2008). At worst, this can be perceived as an inflexible, narrow adherence to standard practices that gets in the way of business activity, or makes life unnecessarily difficult for employees. Clearly, HR needs to take legal and risk perspectives on board, but at the same time it needs to be broader than this. HR needs to draw on a range of perspectives and not be strait-jacketed in its thinking if it is to be relevant and effective.

It’s a similar picture for learning and development (L&D) functions. Effective L&D supports people’s development in ways that are not only business critical, but also methodologically appropriate for the learners: for example, that treat learning as an ongoing process that needs reflection and practice. What works less well is L&D that has been dubbed ‘sheep-dip training’ or ‘injection education’ –

putting people on short didactic information-heavy courses with little regard to what individuals and their organisations really need.

In this report, we argue that behavioural science gives us a fuller understanding of people at work, and as such has a great deal to offer HR as well as L&D. Traditional methods of finding out about ‘our people’ – including opinion surveys, focus groups and discussions with managers – are important, but limited in their perspective and at times prone to false assumptions. Behavioural science offers an additional, different lens, through which we can better comprehend how people think at work and why they act as they do.

Over the last two years, we have been applying behavioural science in particular to L&D (McGurk and Sadler-Smith 2012; Howard-Jones and McGurk 2014; Banks and McGurk 2014; Sadler-Smith and McGurk 2014; Stuart 2014). We now plan to build on this in two ways: firstly, by drawing lessons from behavioural science more broadly for other areas of HR and people management; and secondly, by going beyond the existing research and literature on behavioural science to look at how behavioural science can be practically applied in the world of employment.

What do we mean by behavioural science?

Behavioural science sets out to develop an empirical understanding of how people psychologically react and

behaviourally respond to interventions, environments and stimuli. Based on this understanding, it aims to create optimal systems and approaches to encourage and facilitate desirable behaviour. Behavioural science is a catch-all term that incorporates various disciplines, in particular:

- **Behavioural economics** examines how social and regulatory systems create incentives and constraints, thus shedding light on what influences individual and group behaviour. This can often be counterintuitive. For example, as we discuss in the next section, fines designed to act as a disincentive can in practice lead to an increase in the targeted behaviour.
- **Cognitive psychology** looks at behaviour and thought processes and how people respond to stimuli. Here the emphasis is more on individuals than social systems, but the specific foci and often the experimental methods are often similar to behavioural economics.
- Behavioural or social **neuroscience** looks at brain activity, in particular through image-producing tools such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), and links this to mental processes and tasks. It can highlight similarities in how we respond to situations (for example, threat and social exclusion) and sheds light on how mental processes are prioritised (for example, what happens when 'fight or flight' kicks in).

These disciplines have different theoretical underpinnings and often apply different methods, although the difference between them – especially the first two – is often blurred.

Nor are these categories alone in giving us useful insights to human behaviour at work. Other fields of social science should be looked at alongside these. Thus, broadly, we can usefully draw on sociology and anthropology to understand social systems within organisations, and occupational psychology to understand personality types and behaviour.

Taking a more specific example, naturalistic decision-making (NDM) (Klein 1998) contrasts to experimental psychology research, a limitation of which is that it is conducted in artificial environments. NDM research instead uses cognitive task analysis (CTA), which, borrowing from social anthropology, uses in-depth interviewing and observation to examine real-life situations more directly in context.

Evolutionary psychology also gives us valuable insights. Its starting point is that *'the mind is a set of information-processing machines that were designed by natural selection to solve adaptive problems'* (Cosmides and Tooby 1997). Looking at how humans have evolved over millennia sheds light on why we behave as we do today, including why we find some challenges, such as leadership, so difficult (van Vugt and Ahuja 2010).

Behavioural science and evidence-based management

The application of behavioural science to HR and L&D should be seen as part of the more general drive for evidence-based practice that has been proposed for several years by academics such as Briner (1998), Pfeffer and Sutton (2006) and Rousseau (2006). Behavioural science is far from the only perspective of relevance but it is another significant string to our bow.

'The application of behavioural science to HR and L&D should be seen as part of the more general drive for evidence-based practice that has been proposed for several years.'

Those of us with responsibilities in people management will never be immune to flimsy assumptions about what drives and affects human behaviour, but we can and should challenge ourselves to rely on better-quality evidence.

Why HR? Why now?

The broad field of behavioural science is relatively new. Although some research is four decades old, it is in the last decade that behavioural science has risen in prominence as a field. Two particular developments have occurred.

Firstly, in 2002 Daniel Kahneman was awarded a Nobel Prize for his work on decision-making. Along with his late colleague Amos Tversky, Kahneman is often considered the godfather of behavioural science and his 2011 book, *Thinking, Fast and Slow*, which summarises much of his research, has been a best-seller.

Secondly, in 2008, Richard Thaler and Cass Sunstein wrote *Nudge*, which argued that effective policy should engineer people's 'choice architecture' to facilitate and encourage better decisions. The book led to the UK Cabinet Office setting up its Behavioural Insights Team, aka the 'nudge unit', in 2010. While the previous Labour Government led a drive for evidence-based policy, this often stopped at informing the *content* of policies. The Coalition's nudge unit has gone beyond this, pioneering the application of

behavioural science to inform how they should be *put into practice*.

This is a genuine paradigm shift that is as relevant to the world of HR as it is to government policy. We spend a good deal of time discussing what people management policies are fair and beneficial to business, but it is not enough to respond to challenges by simply developing new policies and processes, or making new services and resources available. To design effective interventions, we may need to carefully consider how people think and what influences their behaviour. Less a question of what standards organisations should have, more a question of how to make them stick.

Key to this is an explicit focus on creating optimal *systems*. This is not possible without a decent understanding of two related things: firstly, how people perceive and respond to different environments, situations, incentives and threats; and secondly, how interventions can work against each other and inadvertently be undermined.

As new fields such as behavioural science develop, HR practitioners should take note, familiarise themselves and reflect on what their organisations can learn. Certainly in the experience of one consultant we interviewed, the HR community tends not to be the first to embrace new thinking from behavioural science:

'I think HR are more sceptical than the business people [of using neuroscience]. That's a dangerous position for HR to be in because they will start getting business people finding neuroscience. ... So you're in danger of your business colleagues coming to you and saying, "why aren't you using this?"' Jan Hills (cited in Stuart 2014)

This would make the case for applying a behavioural science lens to HR even more pressing. Not only could you be missing ways to increase your impact in the organisation, you may not even be keeping up with what is expected of you.

One area of HR that is often more amenable to behavioural science is the practice of organisational development (OD). Coming from a distinct perspective, it naturally centres on how behaviour is shaped, being described as 'taking both a humanistic *and* a business-focused approach' (Garrow et al 2009). An OD mindset is also happier working with ambiguity and complexity and thus helps when looking at cohesive systems. HR can learn a lot from an OD mindset in general, and certainly when looking to make use of behavioural science.

2 What insights does behavioural science give us?

Behavioural science research is often heavily contextualised, studies examining specific situations and particular aspects of our thinking and behaviour. This is necessarily so, as we respond differently to different environments and stimuli. Nonetheless, there are a number of more general conclusions that we can draw. To illustrate, we now summarise some examples of behavioural science insights.

Two ways of thinking

Throughout history, the mind has often been thought of as comprising two modes of thought: emotion and instinct on the one hand, reason and rational thought on the other. One of the most influential models in behavioural science is dual process theory, which develops this view. Kahneman's influential work labels these modes of thought System 1 (which approximates to intuition) and System 2 (reasoning).

We rely on automatic intuitive thinking for efficiency and not to be overwhelmed by the many decisions we make. This is heuristics, or mental shortcuts. Life

without it would be impossibly difficult, but it can also lead us to false assumptions and errors of judgement. Through reflective thought, we can put a check on and overcome such sub-optimal thinking, but this takes conscious effort and typically fails to happen.

Indeed, what we believe is objective thinking is often our attempts to confirm what we already have decided instinctively. Or, as Kahneman (2011, p103) puts it, 'System 2 is more of an apologist for the emotions of System 1 than a critic of those emotions.' This is why we are more susceptible to bias and false assumptions than we would like to believe. It also helps us understand why habits can be hard to break – our minds are hardwired to follow the path of least resistance.

An example of how badly mental shortcuts can mislead us comes through what has been labelled the anchoring effect (Kahneman 2011), whereby completely irrelevant information planted in our minds can skew our decision-making. Dan Ariely and colleagues illustrated this by asking subjects

'We rely on automatic intuitive thinking for efficiency and not to be overwhelmed by the many decisions we make.'

Table 1: Two cognitive modes of thinking

Automatic thinking	Reflective thinking
Uncontrolled	Skilled
Effortless	Controlled
Associative	Effortful
Fast	Deductive
Unconscious	Slow
	Self-aware
	Rule following

Source: Hansen and Jespersen (2013)

‘Brain responses to social pain, such as peer rejection, are very similar to physical pain.’

in an experiment to estimate the financial worth of a range of items *in relation to a random number* (the last two digits of the subjects’ social security numbers). Would they be willing to pay that figure in dollars for the object in question? Despite subjects knowing that this reference point was irrelevant, its size still influenced the value they attached to objects; the larger the two-digit figure, the larger the estimate.

Nonetheless, while our intuitive automatic ‘System 1’ thinking can lead us astray, it is an invaluable and often underused resource (Sadler-Smith and McGurk 2014). Experts make great use of intuition to make swift, accurate judgements without consciously knowing why they are right. What’s thought to happen is that we pick up on anticipatory cues, identifying scenarios or patterns which, as we build expertise, we become primed to recognise (Kahneman and Klein 2009).

A classic example of this comes from research into how fire-fighters make snap decisions in high-pressure situations (Klein 2003). Contrary to the researchers’ hypothesis that they would compare a couple of options, they found that the fire-fighters typically used their intuition to choose just one option, which they mentally tested to picture how it would pan out before following it.

What’s more, we can easily overanalyse decisions – in effect, rely too much on System 2 thinking – leading to confusion and impaired judgement and performance. It is also for this reason that experiments have found the future projections of experts to be worse than tossing a coin. Kahneman explains this as a consequence of overestimating the influence of marginal factors, which as experts we are familiar with, and underestimating the

role of chance. In essence, we put too much onus on the nuances and forget that there can be more major factors at play.

As well as such insights from cognitive psychology, advances in neuroscience have also contributed to our understanding of these processes. For example, the view of the prefrontal cortex as the centre of rational thought that allows us to override our emotions and impulses is widely agreed to be an oversimplification. In fact, the two ways of thinking cannot be separated so clearly. The orbitofrontal cortex, part of the prefrontal cortex, integrates emotions into the decision-making process. This highlights how our emotional, instinctive reactions are more closely entwined with rational thinking than has generally been thought. We rely on instinct to make good decisions as well as bad.

Pleasure and pain, threat and reward

Neuroscience research has highlighted interesting patterns in brain activity for different thought processes. For example, research led by Lieberman (2013) has found that brain responses to social pain, such as peer rejection, are very similar to physical pain, to the extent that they can even be reduced by pain killers.

This brain activity centres on the limbic system, which deals with our emotions, including our perceptions of threat and reward. The limbic system can easily override activity in the prefrontal cortex, the part of our brain associated with rational thought. By examining our brain activity in different scenarios, neuroscience can highlight what conditions lead to the fight or flight response, when the amygdala (part of the limbic system) hijacks the brain in this way.

We can also understand more about the power of incentive. For example, Lieberman presents research on brain activity to show that the reward we associate with social acceptance is so strong that, from an early age, we instinctively learn to ‘mind read’ people around us so that we can adjust our behaviour to fit in.

In an organisational context, such research highlights the need for connectedness and has implications for teamwork. It also gives a further rationale for collaboration: not only do organisations need it to develop agility and avoid developing blind-spots (Taleb 2008, CIPD 2013b), but it supports the well-being of employees.

The distorting power of policies

Why can seemingly sensible interventions backfire? One reason is that their transactional nature can distort the way people view situations. A classic example is the study of the nursery that started imposing fines for parents who picked up their children late (Ariely 2008). Surprisingly, they saw not a decline but a rise in lateness following this move. Why? The researchers argued that many parents switched from seeing lateness as a social ill that caused inconvenience and embarrassment, to viewing it as an additional service they legitimately paid for. The fines shifted perceptions of the value of lateness and the cultural norms that followed.

A lesson from this is not to assume that policies and procedures are independent tools that can be simply applied to fix an identified problem; in fact, they can inadvertently change the nature of

a problem. So we need to carefully consider and perhaps research how people think within existing systems, how they may respond to changes and what systems will be optimal.

Happiness economics

Happiness studies, or hedonic psychology, is now a core part of the behavioural economics literature, the main reason being that we are notoriously bad at predicting what will make us happy, or even gauging what currently makes us happy.

Two classic examples of this are marriage and parenthood (Kahneman 2011, Powdthavee 2011). In both cases, the disappointing truth is that these momentous life events, which are supposed to bring us purpose and fulfilment, in fact have no lasting positive impact on how we assess our happiness. However, the message is not as pessimistic as it sounds. There is no suggestion that marriage and parenthood are somehow worthless. Rather, the argument is that as they become established parts of our lives, they cease being in the forefront of our minds. It is the more immediate, changing or novel aspects of our lives, along with our general psychological disposition, that tend to dictate our happiness.

Happiness scholars argue that by understanding more fully the conditions that mediate happiness, we can make better judgements as individuals and policy-makers about how to maximise this important attribute. In an organisational setting, this may have implications for how we support employee well-being.

‘The transactional nature of policies can distort the way people view situations.’

3 Applications: how can HR benefit?

When an HR intervention is drawn up in your organisation, how broadly is it conceived? Is it typically designed in a way that takes into account how it fits alongside other policies or practices? Are potential unintended consequences considered? In other words, does your HR function tend to think in terms of holistic systems or isolated transactions and issues? And to what extent does it blindly follow conventional wisdom or standard industry practice on the one hand, or carefully look at what will work well in *this* organisation on the other? Do we understand

the mechanics of how leadership, training and procedures shape organisational behaviour and culture?

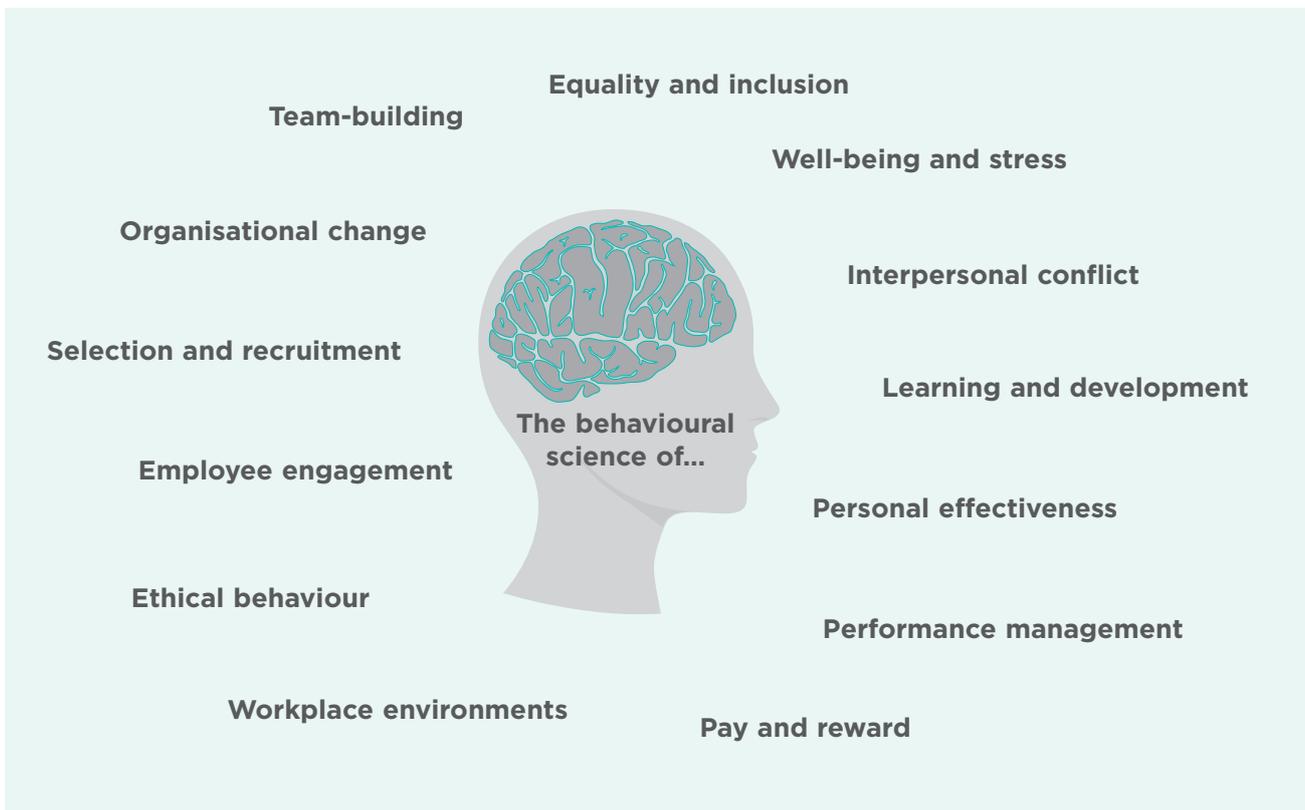
As discussed in Section 2, well-intended interventions can be set up in ways that ignore or misjudge the way that people will react to them. The result can be that they fall flat on their face: people ignore, circumvent or otherwise react badly to them, and they fail to shape behaviour in the way intended.

Related to this, interventions can implicitly or explicitly contradict

other established norms, policies or systems. This can be a key reason they fall flat, or, if they do take hold, it can mean they undermine other desired behaviour.

We now turn to examples of how insights from behavioural science can be applied to areas of HR activity so that, firstly, it will have a more immediate impact and interventions will be successfully adopted into practice; and secondly, will fit alongside existing policies, interventions and norms to form optimal holistic systems.

Figure 1: Potential areas in which behavioural science can be applied



Below we briefly consider aspects of work and HR that may potentially benefit from a behavioural science lens. The areas covered (represented in Figure 1) are illustrative, not exhaustive; there are others (for example, leadership and communication) that are central aspects of HR and run through several of the areas covered, but are not singled out.

Learning and development

As mentioned in Section 1, learning and development has been the focus of our research on behavioural science to date. For example, in Part 1 of our *Fresh Thinking in Learning and Development* series we focused on neuroscience, looking at features such as brain plasticity (the process by which we learn to think and work in different ways) and memory, and their relevance for learning tools and techniques, innovation and creativity (Howard-Jones and McGurk 2014).

In Part 2 of the series, we looked at heuristics, bias, expertise and other aspects of how we reason and decide, and how we can shape our habits and improve our decision-making (Banks and McGurk 2014). And in Part 3 we looked at how insight leads to idea formation and innovation and how intuition complements insight in creativity and problem-solving (Sadler-Smith and McGurk 2014). More recently, we have looked at practical examples of how neuroscience is being applied in learning and development (Stuart 2014).

Selection and recruitment

Dual process theory (see above) sheds light on many aspects of decision-making, including how we make selection and recruitment decisions. We know that we are vulnerable to unconscious bias, such as judging in-groups and out-groups. However, we should

not simply seek to unearth and overcome all our instinctive reactions, as we risk cutting off a source of valuable intuition (Klein 1998, 2003).

Nor should recruiting managers rely too heavily on their experience in predicting how candidates will perform, as they may end up placing too much emphasis on relatively marginal factors (see Section 2). For example, they may pick up that a candidate shares a characteristic with a poor performer they have known, while overlooking that the candidate has very strong reasoning ability, which is a stronger predictor of performance (Banks and McGurk, 2014). Understanding the balance between such factors should help make better decisions.

There are also lessons for recruitment from the perspective of the candidates. Because of our instinctive reactions to threat, we generally perform best in situations of low-level stress. As Hills (2014) argues, because most of us find job interviews inherently stressful, recruiting managers should take care not to make them any more stressful if they want to get a decent reflection of what people are capable of.

Pay and reward

If pay does not by itself set culture, it is one of the clearest articulations of an organisation's actual values and norms, regardless of what values are officially espoused. In some situations, such as parts of investment banking, it is widely accepted that skewed incentives have helped drive behaviour that's out of kilter with ethical and sustainable institutions (CIPD 2013c). In a very different setting, there is currently debate about how, if at all, performance-related pay should be applied to the teaching profession.

As discussed in Section 2, neuroscience research suggests we are hardwired to be driven by the reward of social acceptance and the threat of exclusion.

But threat and reward are not only relevant to social interactions – far from it. Other research has shown that task performance is not enhanced by the combinations of threats and rewards that are often assumed to motivate us. For example, Pink (2009) shows how financial rewards can backfire: by reducing intrinsic motivation they *'can transform an interesting task into a drudge'*.

Remuneration and benefits are a massive part of organisations' expenditure, but what are organisations getting for the money they invest in salaries, bonuses and benefits? As important factors that shape the employment relationship, we should look at the evidence on how different forms of reward influence work-related behaviour and performance.

Performance management

Annual appraisals are a fairly universal aspect of performance management, but do they achieve what they set out to achieve? A common view is that they do not, but are somehow a necessary process anyway.

Already there is solid meta-analysis evidence on the limited benefit and the potential damage caused by person-to-person feedback (Kluger and DeNisi 1996). Indeed, Kahneman (2011) argues that the widely accepted notion that criticism of poor performance helps people improve is a statistical sleight of hand; because of regression towards the mean, we will always tend to improve following unusually poor performance.

‘Neuroscience research shows that our brains are far less able to multi-task than we expect.’

Behavioural science can help us do better in this and other aspects of performance management. For example, considering people’s psychological motivations and responses to threat can help us understand why managers and their reports fail to have frank conversations about performance, or why these go wrong when they do take place. Building on this, insights from behavioural science could provide evidence on what methods work best to influence and support employees to have beneficial performance conversations that maintain or even build trust.

Personal effectiveness and smarter working

How can we maintain focus and work effectively when our tasks are increasingly fragmented? In response to an increasingly fast-paced and digital world, our attention spans are declining and we take on more and more. Yet what is needed, especially in our VUCA (volatile, uncertain, complex and ambiguous) times, is the opposite: greater reflection so that we are less prone to blind spots and less vulnerable to corporate risk (Taleb 2008, Atkins et al 2012).

Neuroscience research shows that our brains are far less able to multi-task than we expect, leading to a loss in focus and quality thinking (Rock 2009). However, it also shows that brain plasticity can work in our favour; that through brain exercises, for example, we can enhance the capacity and quality of our thinking (Merzenich 2013). This can lead us towards smarter working, better decisions and greater effectiveness.

Ethical behaviour

Since the economic crisis, we have seen a string of ethical crises at the heart of the business world. Much of this has focused on the

financial sector, including the Libor and PPI scandals and the irresponsible trading of derivatives that helped trigger the 2008 crash. Indeed, our 2013 survey of financial services employees (CIPD 2013c) found that, over the previous two years, a worrying one in six respondents had felt bullied or put under excessive pressure to behave counter to their own ethics and to the interests of customers. In other sectors, there have been the failures that led to the Deepwater Horizon oil spill and the well-documented failings at the Mid Staffordshire NHS Trust, to name but two cases.

We can use behavioural science to shape ethical norms and behaviour. For example, Dan Ariely’s (2012) research shows that the physical and psychological distance between ourselves and cash influences how honest we are. Give anyone the opportunity to cheat for money and they will cheat more if handed tokens that they take away and change for money than if, at the moment of cheating, they are given hard cash. Thus, simple reminders of the link between complex transactions and real money may lead bankers to behave more responsibly.

Employee engagement

Employee engagement is a broad area that focuses on enriching working lives and strengthening people’s connections with the organisations in which they work to create healthy, dedicated and productive employees whose efforts are aligned with organisational strategy.

Much research into the drivers of employee engagement is based on correlations of data from self-completion surveys. Behavioural science can add to this by providing more robust evidence on what observably affects human behaviour in a work context.

For example, experiments can look at what motivates people or influences how they develop identification with an organisation or group of people.

Equally, insights from behavioural economics and cognitive psychology can also be used to shape management behaviour and organisational culture so that they are more conducive to employee engagement.

Workplace environments

The environments in which we work have a huge impact on us, but organisations rarely take full advantage of the ability to shape them to facilitate desired behaviour and effectiveness. Workplaces can be instrumental in shaping organisational culture – for example, fostering more creative, collaborative or networked environments. Indeed, returning to the theme of ethics, research by Yap et al (2013) has shown that ergonomic factors, such as the size of one's desk or seat, even affect how honest our behaviour is.

By shedding light on how and where we work well (more creatively, efficiently, ethically, collaboratively and so on), behavioural science can contribute to our understanding of how to make workplaces positive, enabling, flexible and, most of all, human.

Organisational change programmes

Those leading change programmes often lament the inevitable resistance that comes from some employees, but neuroscience evidence suggests this is normal behaviour. Firstly, neuroscience highlights the extent to which we are creatures of habit. Habitual thinking and behaviour are essential for the efficient use of our brains, protecting us from being overwhelmed by stimuli. Secondly,

much anxiety about organisational change can be explained by our hardwired responses to threat (Hills 2014).

However, by understanding such processes more fully, we can unlock opportunities. For example, part of the prefrontal cortex – the area of the brain responsible for advanced cognition such as decision-making, forethought and regulation of behaviour – controls '*which habits are switched on at a given time*' (Trafton 2012). Thus, we find that habits are malleable and that old habits can be replaced relatively easily by new ones – a valuable insight when we need to change how we work. Equally, Dowling (2014) argues that enabling employees to self-direct elements of change programmes facilitates brain plasticity and fosters a change-ready mindset.

Team-building and project working

Building a successful team is both art and science. Occupational psychology offers useful psychometric tools (so long as they are well designed and appropriately applied). For example, these can help identify who will best suit which role and even who will work together most productively on a given project; whose working styles, personalities and strengths will complement each other best.

Behavioural science also gives us insight into how to develop effective teams. For example, evidence that our brains are, as Lieberman puts it, 'wired to connect' with other people suggests that we are intrinsically motivated to work as a team. Amazingly, recent research from Stanford University has found that, even if the work itself is conducted individually, simply *inviting* people to work with others can

enhance their enjoyment, interest, persistence and performance (Carr and Walton 2014). In short, emphasising collaboration and joint effort will reap dividends.

Interpersonal conflict

Much interpersonal conflict can be traced to difficulties with performance management and clashes in personality or working styles (CIPD forthcoming), areas we have already discussed. But what happens psychologically when conflict escalates and how can we best resolve it?

Social research has established that formal HR and legal procedures tend to escalate conflict, as parties become entrenched and less willing to concede ground (Denver et al 2007). This was a core observation in the influential Gibbons Review (2007), which argued that mediation and early intervention were more effective means of resolving disputes.

Behavioural science helps us understand why. As innately social beings, interpersonal conflict represents a deep internal crisis; the possibility of being demonised and isolated is instinctively highly threatening and can even affect basic cognitive faculties such as intelligence (Baumeister et al 2002). This generates severe reactions because it causes the limbic system to hijack the brain (see Section 2) and make rational, considered thought difficult. On the other hand, reconciliation and maintaining relationships are huge psychological 'rewards' for mediators to leverage in encouraging parties to focus on resolution and compromise.

Equality and inclusion

Unconscious bias has become a staple application of behavioural science in an employment context. The key message is

that we instinctively look for similarities between ourselves and others and are primed to quickly judge ‘outsiders’; and that these evolutionary traits don’t fit well with the demands of today’s organisations (van Vugt and Ahuja 2010). As individuals and organisations, we need to relate positively to difference, not just to stay on the right side of equality law, but in order to truly benefit from the range of available talent, and to avoid groupthink and create organisations that can respond and thrive in a fast-changing world.

Drawing on a range of evidence, including behavioural science as well as other social science disciplines, Stevens et al (2008) offer some solutions. They argue that a ‘*colorblind*’ approach to diversity (that is, not recognising differences) fails minority groups because it suggests their distinctiveness is not important, yet a simple multicultural approach that highlights differences ‘*excludes nonminorities and threatens unity*’. Instead, ‘*belongingness*’ can be fostered in a diverse organisation by positioning diversity as an opportunity to ‘*create high-quality relationships across difference*’ rather than as a threat.

Well-being and stress

The study of workplace stress has long received attention from researchers. We know stress can impede performance as well as provoke medical problems, and that factors such as powerlessness exacerbate stress and factors such as exercise help reduce it (for example, see Cooper 2008). Much of the research focuses at the level of social rather than cognitive processes but behavioural science has distinct insights to add.

Firstly, it gives a description of what happens to our brains under stress. As already discussed, high levels of stress lead to fight or flight tendencies and impaired cognition. But from a psychological view, moderate stress creates a healthy tension, increasing our performance (Sincero 2012). Indeed, Csikszentmihalyi’s celebrated description of ‘flow’, in which our activity is characterised by absorption and energy, requires a degree of challenge (Hills 2014).

Behavioural science also sheds light on how best to manage psychological well-being. For example, based on self-determination theory (for example, see Ryan and Deci 2002), recent research shows that the extent to which we experience competence, relatedness and autonomy influences our physical and mental health (González et al 2014). This has clear implications for the work we do and how we are managed.

Making the link with practice

In this section we have briefly considered aspects of work and HR that may potentially benefit from a behavioural science lens. The areas covered are illustrative, not exhaustive; there are others (for example, leadership and communication) that are central aspects of HR and run through several of the areas covered, but have not been singled out.

Further, there are some common behavioural science insights that are relevant to several of these areas. An example would be David Rock’s (2008) SCARF model (Status, Certainty, Autonomy, Relatedness, Fairness), which describes how employees respond to threat and reward in interpersonal relationships and is relevant to a number of situations.

Nonetheless, by focusing in detail on these specific contexts – each of which warrants its own attention – we can develop more effective people management interventions and drive change. It is right that we question our assumptions about how people think and behave at work and take the time to develop an evidence-based view. In the next section we ask to what extent we can sensibly do this in practice.

4 How much should we rely on behavioural science?

Having looked at the potential relevance of behavioural science to the world of work, we now consider criticisms levelled at the field and ask how we should apply it sensibly to the world of work.

Criticism of behavioural science

A bunch of neuromyths?

There has been a backlash from certain quarters against behavioural science research and its increasingly common referencing. One reason neuroscience has come in for flak is that it's seen as a faddish interest that's often talked about in a shallow, glib and inaccurate way. Classic culprits among 'neuromyths' (Howard-Jones and McGurk 2014) include the 'left brain/right brain' distinction between logical and creative thinking and the assertion that we use only 10% of our brains. These are examples of how a little knowledge misapplied can nonetheless get bandied around quite widely if it's an idea that gels.

Too expensive?

But even if it's applied correctly, the challenge has been made that neuroscience only tells us a limited amount about our brains and has far fewer implications for human behaviour than is often suggested. As Alva Noë puts it, functional brain images '*are not pictures of our brains in action, and so they are positively not images of our minds at work*' (Noë 2012). Given the highly specific nature of neuroscience, the expense of brain scanning is contentious for some, who feel that the money would be better spent on other areas (Hodgkinson 2014).

Manipulative?

Behavioural economics has also received criticism. The 'nudge' theory and its manifestation in practice through the Behavioural Insights Team have been described as manipulative and ethically questionable. In response, the founders of nudge theory argue that it is the basis for a benign 'libertarian paternalism', influencing us towards better outcomes that we might not choose normally (Thaler and Sunstein 2003). But others think there is a case to be answered.

In developing a framework for nudge applications, Hansen and Jespersen (2013) argue that it may be manipulative but this is not necessarily the case. It can be a transparent way of focusing people's attention to make a more conscious choice (for example, the 'fly-in-the-urinal' nudge that focuses men on their aim). And they argue that even nudges that activate instinctive responses can also be transparent: for example, when relaxing music is played as we board a plane.

Nor would it be right to say the work of the Behavioural Insights Team is only about nudges. It is also about removing barriers, facilitating courses of action that are seen by all as desirable. For example, when investigating the low uptake for loft insulation grants, the team found that a common barrier was the hassle involved in clearing out one's loft. By offering a service that also included a loft clearing service, uptake was seen to triple, even though this was a more expensive option (Benedictus 2013).

'One reason neuroscience has come in for flak is that it's seen as a faddish interest that's often talked about in a shallow, glib and inaccurate way.'

Finally, if there is manipulation, that does not need to be the end of the story. As Wilkinson (2013) puts it, *'some ends justify some means and a minor amount of manipulation may be justified if it produces enough benefit'*.

Taking a balanced and informed view

So while behavioural science is no panacea, we should not ignore the value that it can represent for understanding human behaviour at work and developing more effective HR interventions. What is needed is a selective, careful approach. Below we suggest four steps.

Become research-savvy

Behavioural science does have the potential to be the latest fad in people management. This should be resisted, as it will lead to shallow understanding, myths and confusion and, ultimately, the genuinely useful insights will be devalued. Thought leaders and influencers in HR need to develop skills to understand different types of research – to become sufficiently 'shallow clever': while we may not be experts, we know enough to make sensible applications of available evidence (McGurk and Sadler-Smith 2012).

We should also weigh up the different types of evidence available, developing an integrated, multidisciplinary approach that blends behavioural science with other social science and practical HR knowledge.

Balance types of evidence

It's important to give some consideration to the different evidence available. For example, much cognitive psychology is based on research with experimental lab-based research. A strength of this is that, in removing many aspects of context, distinct influences and behaviours or responses can be isolated more easily, giving clearer conclusions on causal relationships. By comparison, in field research, where there is less control over context, other factors can creep in and skew results.

On the other hand, removing normal contexts can result in artificial responses. Thus, List and Al-Ubaydli (2014) argue that lab designs 'inflate scrutiny', making it likely that subjects behave in more altruistic or socially acceptable ways than they would normally. In addition, many psychological experiments are conducted with students and thus can have limited application to wider populations.

In short, we need to take a balanced view, as there are strengths and weaknesses of all types of evidence. This can be done in particular by seeking out contextualised evidence that reflects the real world (for example from anthropological or NDM research – see Section 1) as well as evidence from experimental designs.

Integrate with practical experience

Drawing on a good research base does not mean we should disregard the practical

organisational considerations in front of us. While academic evidence on effective people management may give an ideal textbook solution, we should look at issues such as barriers to implementation alongside this. Informed judgements can be based on what we perceive in a current situation as much as on empirical evidence.

For example, despite evidence on the negative impacts of feedback on motivation (see Section 3), it is hard to envisage a situation in which it does not form part of effective performance management. We can adjust feedback styles to mitigate the demotivating effects and if there is a psychological fallout, appropriate support can be given. But employees need to be informed one way or another if their work is not up to standard.

Be brave in making evidence-based decisions

In other areas we can perhaps be bolder. For example, in the face of evidence that individual performance-related pay works against behaviours that are crucial in some jobs and may even impede performance more generally, there may be a clear expectation within organisations or across industries that it is used. If an employer is to move away from this, it will need to convince its board, shareholders and perhaps potential recruits not only that the alternatives work, but that they don't have any significant downsides. But if HR doesn't lead the way, who will?

Next steps: forthcoming CIPD research on behavioural science

Because of the varied and specific nature of behavioural science, it is a perspective and evidence base that warrants attention in distinct areas of HR. Our programme into the behavioural science of learning and development has most recently included research into how L&D practitioners are starting to integrate neuroscience insights into their work. Following on from this, we will start its wider application into employment issues by focusing on two areas.

Firstly, we will look at the behavioural science of pay and reward. A central question here is: what behaviour and performance do different forms of financial and non-financial reward encourage, and how does this vary between work contexts? Different regimes will generate different expectations and incentivise different types of behaviour, and HR should be wise to this.

We will look at a wide range of reward and recognition schemes, such as fixed versus variable pay, individual versus team bonuses, pay by commission, non-financial rewards and share plans; not to mention the level of remuneration, in particular excessive pay and bonuses.

Secondly, we will look at the behavioural science of selection and recruitment. The main challenge is to make best use of the strengths in our decision-making, to compensate for our weaknesses with appropriately designed techniques and tools, such as psychometrics, and to make sure we rely on these tools as we should! There is anecdotal evidence that, where psychometrics are used in recruitment, the results are often ignored once the recruiting manager meets the candidate in an interview.

Related to this, we will also look at the experience of employees in the recruitment process. On the one hand, the experience employers give candidates in recruitment is a powerful demonstration of the employer brand and thus influences how attractive an organisation is to potential candidates. On the other hand, candidates experiencing too much stress will not perform at their best. This can get in the way of an accurate assessment of their likely performance in the job.

Our web hub-page [cipd.co.uk/behaviouralscience](https://www.cipd.co.uk/behaviouralscience) contains more outputs from this research programme.

‘Because of the varied and specific nature of behavioural science, it is a perspective and evidence base that warrants attention in distinct areas of HR.’

References

CIPD publications on behavioural science

BANKS, A. and MCGURK, J. (2014) *Fresh thinking in learning and development Part 2: Cognition, decision and expertise*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/research/cognition-decision-expertise.aspx> [Accessed 17 October 2014].

HOWARD-JONES, P. and MCGURK, J. (2014) *Fresh thinking in learning and development Part 1: Neuroscience and learning*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/research/neuroscience-learning.aspx> [Accessed 17 October 2014].

MCGURK, J. and SADLER-SMITH, E. (2012) *From steady state to ready state: A need for fresh thinking in learning and talent development?* London: CIPD. Available at: <https://www.cipd.co.uk/hr-resources/research/from-steady-state-ready-state.aspx> [Accessed 17 October 2014].

SADLER-SMITH, E. and MCGURK, J. (2014) *Fresh thinking in learning and development Part 3: Insight and intuition*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/research/insight-intuition.aspx> [Accessed 17 October 2014].

STUART, R. (2014) *Neuroscience in action: Applying insight to L&D practice*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/research/neuroscience-action.aspx> [Accessed 17 October 2014].

Other publications

ARIELY, D. (2008) *Predictably irrational: the hidden forces that shape our decisions*. New York: Harper Collins.

ARIELY, D. (2012) *The (honest) truth about dishonesty: how we lie to everyone – especially ourselves*. London: Harper.

ATKINS, D., FITZSIMMONS, A., PARSONS, C. and PUNTER, A. (2012) *Roads to ruin: a study of major risk events*. London: airmic / Cass Business School.

BAUMEISTER, R., TWENGE, J. and NUSS, C. (2002) Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology*. Vol 83, No 4. pp817–27.

BENEDICTUS, L. (2013) The nudge unit – has it worked so far? *Guardian*. 2 May. Available at: <http://www.theguardian.com/politics/2013/may/02/nudge-unit-has-it-worked> [Accessed 17 October 2014].

BRINER, R. (1998) *What is an evidence-based approach to practice and why do we need one in occupational psychology?* Proceedings of the 1998 British Psychological Society Occupational Psychology Conference, pp39–44.

CARR, P. and WALTON, G. (2014) Cues of working together fuel intrinsic motivation. *Journal of Experimental Social Psychology*. Vol 53, July. pp169–84.

CHARTERED INSTITUTE OF PERSONNEL AND DEVELOPMENT. (2012) *Business savvy: giving HR the edge [online]*. London: CIPD. Available at <https://www.cipd.co.uk/hr-resources/research/business-savvy-giving-hr-edge.aspx> [Accessed 17 October 2014].

CHARTERED INSTITUTE OF PERSONNEL AND DEVELOPMENT. (2013a) *HR outlook: autumn 2013: a variety of leader perspectives [online]*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/survey-reports/hr-outlook-autumn-2013-leader-perspectives.aspx> [Accessed 17 October 2014].

CHARTERED INSTITUTE OF PERSONNEL AND DEVELOPMENT. (2013b) *Hacking HR to build an adaptability advantage: Hackathon report [online]*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/research/hacking-hr-advantage.aspx> [Accessed 17 October 2014].

CHARTERED INSTITUTE OF PERSONNEL AND DEVELOPMENT. (2013c) *Employee outlook: focus on rebuilding trust in the City [online]*. London: CIPD. Available at: <http://www.cipd.co.uk/hr-resources/survey-reports/employee-outlook-focus-rebuilding-trust-city.aspx> [Accessed 17 October 2014].

CHARTERED INSTITUTE OF PERSONNEL AND DEVELOPMENT. (forthcoming) *Employee outlook: focus on workplace conflict*. London: CIPD.

- COOPER, R. (2008) *Stress: CIPD toolkit*. London: Chartered Institute of Personnel and Development.
- COSMIDES, L. and TOOBY, J. (1997) *Evolutionary psychology: a primer [online]*. Santa Barbara: University of California. Available at: <http://www.cep.ucsb.edu/primer.html> [Accessed 17 October 2014].
- CSIKSZENTMIHALYI, M. (2008) *Flow: the psychology of optimal experience*. London: Harper Perennial.
- DENVIR, A., BROUGHTON, A., GIFFORD, J. and HILL, D. (2007) *The experiences of sexual orientation and religion or belief employment tribunal claimants*. Research Paper 02/07. London: Acas.
- DOWLING, N. (2014) It's all in the mind. *Training Journal*. August. pp47–51.
- GARROW, V., VARNEY, S. and LLOYD, C. (2009) *Fish or bird? Perspectives on organisational development (OD)*. Research Report 463. Brighton: Institute for Employment Studies.
- GIBBONS, M. (2007) *A review of employment dispute resolution in Great Britain*. London: Department for Trade and Industry.
- GONZÁLEZ, M., SWANSON, D., LYNCH, M. and WILLIAMS, G. (2014) Testing satisfaction of basic psychological needs as a mediator of the relationship between socioeconomic status and physical and mental health. *Journal of Health Psychology*. 7 August.
- HANSEN, P. and JESPERSEN, A. (2013) Nudge and the manipulation of choice: a framework for the responsible use of the nudge approach to behaviour change in public policy. *European Journal of Risk Regulation*. Vol 1. pp3–28. Available at: <http://www.lexxion.de/pdf/ejrr/02%20Nudge%20and%20the%20Manipulation%20of%20Choice.pdf> [Accessed 17 October 2014].
- HILLS, J. (2014) *Brain-savvy HR: a neuroscience evidence base*. London: Head Heart + Brain.
- HIRSH, W., CARTER, A., GIFFORD, J., STREBLER, M. and BALDWIN, S. (2008) *What customers want from HR: the views of line managers, senior managers and employees on HR services and the HR function*. IES Report 453: Brighton: Institute for Employment Studies.
- HODGKINSON, G. (2014) *Does business and management need neuroscience?* Core, edition 2, pp64–65. Coventry: Warwick Business School.
- KAHNEMAN, D. (2011) *Thinking, fast and slow*. London: Penguin.
- KAHNEMAN, D. and KLEIN, G. (2009) Conditions for intuitive expertise: a failure to disagree. *American Psychologist*. Vol 64, No 6. pp515–26.
- KLEIN, G. (1998) *Sources of power: how people make decisions*. Cambridge, MA: MIT Press.
- KLEIN, G. (2003) *The power of intuition: how to use your gut feelings to make better decisions at work*. New York: Currency Doubleday/Random House.
- KLUGER, A. and DENISI, A. (1996) The effects of feedback interventions on performance: a historical review, a meta-analysis and a preliminary feedback intervention theory. *Psychological Bulletin*. Vol 119, No 2. pp254–84.
- LIEBERMAN, M. (2013) *Social: why our brains are wired to connect*. Oxford: Oxford University Press.
- LIST, J. and AL-UBAYDLI, O. (2014) The generalisability of experimental results in economics. *Vox*. 17 January. Available at: <http://www.voxeu.org/article/generalisability-experimental-results-economics> [Accessed 17 October 2014].
- MERZENICH, M. (2013) *Soft-wired: how the new science of brain plasticity can change your life*. San Francisco: Parnassus.
- NOË, A. (2012) *Brain scans don't catch the brain in action*. Published online by 13.7: Cosmos & Culture, 7 December. Available at: <http://www.npr.org/blogs/13.7/2012/12/07/166733094/brain-scans-dont-catch-the-brain-in-action> [Accessed 17 October 2014].
- PFEFFER, J. and SUTTON, R. (2006) *Hard facts, dangerous half-truths, and total nonsense: profiting from evidence-based management*. Boston: Harvard Business School Press.
- PINK, D. (2009) *Drive: the surprising truth about what motivates us*. New York: Riverhead Books.
- POWDTHAVEE, N. (2011) *The happiness equation: the surprising economics of our most valuable asset*. London: Icon Books.
- ROCK, D. (2008) SCARF: a brain-based model for collaborating with and influencing others. *NeuroLeadership Journal*. Vol 1. pp44–52.
- ROCK, D. (2009) *Your brain at work: strategies for overcoming distraction, regaining focus, and working smarter all day long*. New York: HarperBusiness.

- ROUSSEAU, D. (2006) Is there such a thing as evidence-based management? *Academy of Management Review*. Vol 31. pp256–69.
- RYAN, R. and DECI, E. (2002) An overview of self-determination theory. In: DECI, E. and RYAN, R. (eds) *Handbook of self-determination research*. Rochester, NY: University of Rochester Press, pp3–33
- SEARS, L (2010) *Next Generation HR*. London: CIPD. Available at http://www.cipd.co.uk/binaries/next-generation-hr_2010-time-for-change..pdf
- SINCERO, S. (2012) *How does stress affect performance?* *Explorable.com online article*. Available at: <https://explorable.com/how-does-stress-affect-performance> [Accessed 17 October 2014].
- STEVENS, F., PLAUT, V. and SANCHEZ-BURKS, J. (2008) Unlocking the benefits of diversity: all-inclusive multiculturalism and positive organizational change. *Journal of Applied Behavioral Science*. Vol 44. pp116–33.
- TALEB, N. (2008) *The black swan: the impact of the highly improbable*. London: Penguin.
- THALER, R. and SUNSTEIN, C. (2003) Libertarian paternalism. *The American Economic Review*. Vol 93. pp175–9.
- THALER, R. and SUNSTEIN, C. (2009) *Nudge: improving decisions about health, wealth and happiness*. London: Penguin.
- TRAFTON, A. (2012) How the brain controls our habits: MIT neuroscientists identify a brain region that can switch between new and old habits. *MIT News*. 29 October. Available at: <http://newsoffice.mit.edu/2012/understanding-how-brains-control-our-habits-1029> [Accessed 17 October 2014].
- VAN VUGT, M. and AHUJA, A. (2010) *Selected: why some people lead, why others follow, and why it matters*. London: Profile Books.
- WILKINSON, M. (2013) *Nudges manipulate, except when they don't*. LSE blog post, 13 August. Available at: <http://blogs.lse.ac.uk/politicsandpolicy/nudges-manipulate-except-when-they-dont/> [Accessed 17 October 2014].
- YAP, A., WAZLAWECK, A., LUCAS, B., CUDDY, A. and CARNEY, D. (2013) The ergonomics of dishonesty: the effect of incidental posture on stealing, cheating, and traffic violations. *Psychological Science*. 25 September.



Chartered Institute of Personnel and Development
151 The Broadway London SW19 1JQ UK
Tel: +44 (0)20 8612 6200 Fax: +44 (0)20 8612 6201
Email: cipd@cipd.co.uk Website: cipd.co.uk
Incorporated by Royal Charter Registered charity no.1079797