



City Research Online

City St George's, University of London

Citation: Yates, J. (2015). The heart has its reasons which reason knows not: The role of the unconscious in career decision making. *Journal of the National Institute of Career Education and Counselling*, 35, pp. 28-35.

This is the published version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: <https://city-ref-test.eprints-hosting.org/id/eprint/18009/>

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to [City Research Online policy](#).

'The heart has its reasons that reason knows nothing of': the role of the unconscious in career decision making

Julia Yates

The complexity of career paths in the 21st century has led to a rise in the number of career changes in a typical working life. Effective career practitioners, therefore, should have a good understanding of the process of career choice. One aspect of decision making which has attracted attention in the literature is the role of the unconscious or gut instinct. Once considered best ignored, its potency and value are now recognised. Drawing from decision theory, cognitive neuroscience and behavioural economics, this paper summarises evidence of the most common and effective decision making strategies used in career choice, and considers the implications for practice.



Introduction

Indecisiveness has been identified as one of the ten issues which clients are most likely to bring to career practitioners (Gati, Krausz and Osipow, 1996) and it is no wonder that clients find career choices difficult as evidence shows us that career decisions are empirically demanding. Cognitive psychologists have identified some features which render one decision more challenging than another: difficult decisions are those with a large number of alternative options, where there is a degree of uncertainty about the outcome and where there is significant potential for loss if a bad choice is made (Hastie and Dawes, 2010). Career decisions often fall into all three of these categories, with 37,000 job titles to choose between in the UK (ONS, 2010), decisions often being based

on incomplete and conflicting information (Gati et al, 1996) and career choice inextricably bound up with identity (Ibarra, 1999).

There is therefore a clear need for information and advice on how to make better decisions, to ensure that practitioners are fully equipped to offer appropriate support to clients who struggle to make their choices. Career learning frameworks (for example Barnes, Bassot and Chant, 2013; Law and Watts, 1977) have long acknowledged the importance of decision making in career learning. The factors influencing the decision are covered in career theories widely – whether those are career interests (Holland, 1997), drivers, (Schein, 1990), chance events, (Bright and Pryor 2005), or life themes (Savickas, 2005), and strategies for career decision making have been examined through decision making styles and profiles (Bimrose and Barnes, 2007; Gati et al, 2010). It is, however, something of a paradox that whilst career decision making looms large in both career theory and practice, the literature provides only a limited understanding of the processes underpinning how good career decisions are made, and little advice on what career practitioners can do to enhance clients' decision making skills. This article seeks to make a start on addressing this gap by summarising the existing relevant literature and making some initial suggestions for practice.

Decision making processes

Scholars have identified two distinct processes through which we make decisions. The first is gut instinct (also referred to as System 1 reason, experiential reason,

or heuristic based reason), which is an unconscious, instantaneous and automatic process that relies heavily (although not exclusively) on emotion. The gut instinct processes almost immeasurable amounts of data in an instant and makes use of a series of heuristics or rules of thumb to reach a conclusion. The second decision making process is conscious rationality, (also known as System 2 or rule based reason) which, by contrast, is a conscious and deliberate strategy: individuals are in control of the process and can articulate the steps involved in reaching the conclusion. Conscious rationality tends to be more comprehensive but demands considerably more cognitive effort than gut instinct. Researchers continue to debate the exact nature of the distinctions between the two systems (Mikels, Maglo, Red and Kaplowitz, 2011). For some scholars, the essence of the difference lies in whether the processing happens in the unconscious (System 1) or the conscious (System 2). For others, the key distinction lies in the role that emotions has on the process, which is thought to be far more significant in System 1 processing (Evans, 2008). Epstein (1994) suggests that the systems differ in how they store knowledge, with the System 1 storage being in the form of images, and the System 2 storage system based on words.

Evidence shows (for example, Kahneman, 2003; Stanovich and West, 2000) that decision makers can reach different conclusions depending on the system used but we should be cautious about generalising these results. Much of the research has been conducted in artificial settings using experimental designs which manipulate participants to use one or the other decision making processes (Mikels et al. 2011) rather than examining real-world decisions.

Rational decision making

Rational decision theory dominated decision making literature for much of the 20th century. Hastie and Dawes (2010) sum up the message which emerged from traditional decision making research that 'a decision is a good one if it follows the laws of logic and probability theory' (p. 42). A number of different rational decision theories have been put forward over the last 50 years (Browning, Halcli and Webster, 2000). The theories presuppose that behaviour is rational, and that when considering what action to take, we

weigh up the costs and benefits, and make our choices based on the behaviour which is most likely to bring the highest reward (Homans, 1961).

A rational approach to decision making has been applied directly to the career decision making arena. Expected utility theory (a rational decision theory which is thought to be particularly effective when making probabilistic decisions) has been identified as a useful framework for career choice (Pitz and Harren, 1980). The expected utility theory of careers advocates that an individual should identify the factors which are important in a future job (for example, salary, distance from home, interesting colleagues) and should score each possible career alternative based on the extent to which each job would fulfil each criteria. Scores could then be weighted based on how important a particular factor is, and on the basis of the chances of one's success in each field. Gati (1986) proposed the sequential elimination model, an extension of expected utility theory, in which options are gradually narrowed down, factor by factor: an individual might first rule out all the career options which pay below a certain salary, might then dismiss all those which are more than five miles from home and would finally choose the one which would have most interesting colleagues.

Problems with rational decision theories

Rational decision theories have intuitive appeal, but two areas raise doubts about their suitability for career practice.

The first argument lies in the relationship between normative and descriptive approaches to theory. Rational decision theories are normative, in that they seek to provide a model for good decision making: they explain how decisions ought to be made. Descriptive theories, in contrast, simply describe how decisions are made, with no judgement or advice on the effectiveness of these processes. Descriptive approaches have generated empirical evidence which suggests that as decision-makers, we are likely to rely on gut instinct rather than conscious logic in most situations, as Phillips laments (1997: 278), 'those who have considered what actually happens in the decision-making process have offered the nearly unanimous conclusion that rational decision making simply does

'The heart has its reasons that reason knows nothing of'...

not reflect the decider's reality', yet advice on how to make decisions has been almost exclusively rational.

But does this matter to us in practice? Is it problematic that the strategies we advise clients to use are different from those which they have chosen to use themselves? It could be argued that how people actually make decision should have no bearing on career practice – as long as we know the best way to make a decision, we can share that information with clients and encourage them to follow this process. The risk however is that this approach would lead to clients who have nearly reached an instinctive decision being told by a career practitioner to ignore the progress that they have already made and start again from scratch using a different decision making process. This feels like a far more onerous task, both for the client, who loses the understanding they have already gained, and has to start over, and for the career practitioner who needs to find a way to explain and teach a whole new decision making process. A more pragmatic approach to career practice, which would allow clients to capitalise on their existing thinking is to identify successful real-world mechanisms for making career decisions, and then use this understanding to support clients whose decision processes have not been successful. Clients who have nearly reached a decision through their intuition in this case would then be supported to extend their existing strategies to reach a conclusion. This approach too could lead to clients honing their already fairly sophisticated decision making expertise, rather than having to learn a brand new decision making strategy.

The second challenge to the supremacy of rational decision making is that it is often found to be less effective than heuristic based unconscious reason, with evidence gleaned from a wide range of contexts showing that in particular situations intuition can outperform conscious logic time after time. In fact, Hastie and Dawes (2010:232) conclude that 'we cannot cite any research based proofs that deliberate choice habits are better in practical affairs than going with your gut intuitions'. In summary, evidence suggests that System 2 is neither the most common nor necessarily the most effective way to make decisions.

Although beyond the scope of this article, it is important to acknowledge the cultural dimension on

this discussion. The literature covered here is almost exclusively drawn from the west, examining the decision making processes of western participants. Individuals from other cultures may be more likely to rely on different processes for their choices.

Gut instinct

The gut instinct is an unconscious process which makes automatic, instantaneous judgements. The gut instinct makes use of a number of heuristics or rules of thumb which serve as short cuts to help us make reasonably good decisions (Gigernezer, Todd, and the ABC Research Group, 1999). These heuristics are efficient, in that they use minimal cognitive effort and are very fast, and so are useful in most everyday decision making. Researchers estimate that where the conscious can process 2 – 3 bits of information per second, the unconscious can do 11,200,000 bits per second (Dijkstehuis et al, 2006). Heuristics are based on primitive mental processes and are developed over time based on the trial and error of our own experiences, through vicarious learning and via direct instruction (Cohen et al, 1990).

Emotions have been shown to play a significant role in instinctive decisions (Le Doux, 1996; Rolls, 1999; Slovic et al, 2002; Zajonc, 1980). Neuroscience has furnished us with a suggestion of the mechanism at play (Ito and Cacciopo, 1999) proposing that a stimulus triggers a hormonal response: dopamine mediates a positive reaction and acetylcholine mediates a negative reaction. This hormonal response is global (is it is not nuanced and does not acknowledge areas of strength and weakness) producing a general impression of the stimulus (pleasant or unpleasant), and the response is unconscious and instantaneous.

The unconscious process is not voluntary and so is inescapable – we cannot choose not to respond in this way, and it is not verbally explicit so can be hard to articulate (Kahnemann, 2003). One impact of the immediacy of the unconscious response is that our gut instinct can reach a conclusion before the conscious mind has even begun to organise and recall the relevant information (Zajonc, 1980). This explains the experience, familiar to many of us, of knowing that we enjoyed a book, or film, but being unable to recollect a single detail of the plot. This may also explain how

an individual can have a sense that they wouldn't like a particular occupation without necessarily being able to identify any of the core duties which the job might entail.

Evidence suggests that the gut instinct is at least as good a decision making mechanism as rational decision making most of the time (Gigerenzer, et al 1999; Payne, Bettman, and Johnson, 1993) and has been shown to be particularly effective in making decisions where there is too much information, no definitive right answer, and where creativity is needed to find a solution (Gigerenzer et al, 1999). It is useful to reflect that these factors appertain to many career decisions.

Problems with the gut instinct

A side effect of the reliance on heuristics for decision making is that the gut instinct is subject to a range of biases and errors (Tversky and Kahneman, 1974). Decision makers relying on their instincts tend to ignore sample sizes, they give a disproportionate significance to recent and out of the ordinary information, and use heuristics which are subject to biases such as context (Huber and Puto, 1983), order effects, (Nisbett and Wilson, 1977) and framing (Fiske and Taylor, 1991). Unconscious decisions are relatively intractable – even when new evidence comes to light, instinct often doesn't change to reflect the new information (Zajonc, 1980). Experts in a wide range of fields have been shown to rely on System 1 reasoning, which may suggest that instinct is a more highly advanced decision making mechanism, but the effectiveness of these expert decisions relies on many hours of practice (Gigerenzer, 2007).

How we actually make decisions

I have explained the two systems above as though they are entirely separate systems but inevitably, the reality is not quite as neat.

In the early days of decision theory, System 1 heuristics were thought of as response errors which should be corrected (Cohen, 1981), and later as side effects to normal cognition (Rumelhart, 1984). More recently compelling evidence has emerged on the

value of instinct as a complement to tradition models (Chaiken and Trope, 1999; Damasio, 1994). The current direction of thinking is that 'no task is "process pure"' (Ferreira et al, 2006) and that all decisions will rely on both systems of decision making combining the rational conscious logic of System 2 with the intuition of System 1.

The exact nature of the associations between the two processes is still under debate, but whilst a range of dual process models depict different relationships (for example, Griffin, Gonzalez and Varey, 2001; Stanovich and West, 2000) the potency of the gut instinct is generally accepted.

Some suggest that System 2 monitors the quality of mental operations generated by System 1 (Gilbert, 2002), although acknowledge that it doesn't always do it very well (Kahneman and Frederick, 2002). Motivated reasoning (Brownstein, 2003) describes a process of post hoc rationality, in which the conscious mind provides a rational justification for the decision which the unconscious gut instinct has already made. Zajonc, (1980:155) neatly illustrates this with the story of an attempt to use rational logic to decide which job to take: 'I get half way through my...balance sheet and say "Oh hell, it's not coming out right. I have to find a way to get some pluses over on the other side."' When the rules governing instinct and conscious reason conflict, and an individual is faced with choosing between a System 2 outcome which they know is rational, or a System 1 option which they know is not, their gut instinct will often dominate (Denes-Raj and Epstein, 1994).

There is some evidence of the processes which are chosen in different decision making contexts. Hastie and Dawes (2010) identify ten common decision making strategies, ranging from the instinctive 'recognition heuristic' (where an individual chooses the first alternative that they recognise) through to the rational 'additive linear model' (in which each attribute for each option is weighted by their importance to the current goal, and the weighted values are all added up to reveal the right choice). In general, strategies relying on conscious System 2 logic require more cognitive effort, but provide a more comprehensive analysis of the options. Strategies relying on the unconscious System 1 process are easier and quicker,

'The heart has its reasons that reason knows nothing of'...

but are less likely to take all factors or options into account. It seems that decision makers exhibit a fairly sophisticated 'meta-rationality' in choosing which decision making strategies they use (Hastie and Dawes, *ibid*). The more thorough (i.e. System 2) decision making strategies tend to be used for more important decisions, except in circumstances where information is too plentiful or incomplete, or where outcomes are not predictable. In these cases System 1 logic tends to dominate.

Career decisions

The evidence I have summarised above is principally drawn from decision theory, neuroscience and behavioural economics, but the received wisdom of relying on rational decision making processes has been echoed within the career decision making arena (for example, Holland, 1985; Super, 1980). Krieshok (2009:278) affirms that 'the representation of vocational introspection as a conscious and wilful process remains the dominant paradigm'. But empirical evidence from the career sphere, and inferences which we can reasonably make from the broader decision making field are raising questions around these assumptions in career decision making too.

Much of the evidence garnered from the field of career decision making suggests that intuitive decision styles dominate career choice either as the acknowledged decision making process, or via the process of motivated reasoning described above, but there is some evidence that a combination of conscious and unconscious processes might lead to the best career decisions.

Blustein and Strohmer (1987) conducted research which highlights that students do not always use rational approaches when considering career options. In these studies, participants were asked to assess the personal attributes required for a range of occupations. When examining jobs in occupational areas which they were considering for their own future careers, participants tended to emphasise the need for personal attributes which they felt they themselves possessed; when analysing occupations they were not intending to pursue, participants were more likely to stress the need for personal qualities

they did not possess. Participants thus highlighted how well-matched they were to the jobs they were already contemplating, and how unsuitable they would be for those positions which they had previously disregarded.

These results echo Soelberg's (1967) findings that whilst participants reported that they were using rational techniques for career decision making, in reality, they were relying on intuitive approaches and Greenbank (2009:259) who found that 'students were not adopting a rational/comprehensive approach' when it came to decisions about their next steps.

Evidence of links between decision making processes and career outcomes are in very short supply, but one study, (Singh and Greenhaus, 2004) does indicate that when the two systems are combined, decision makers are more likely to make optimal decisions. Their study matched up decision making processes with the degree of person-job fit that career changers experienced in their new jobs and found that participants who made use of both conscious and unconscious decision processes were more likely to find themselves with higher degrees of person-job fit.

In addition to the lessons learned from career decision making theory research, we can make some inferences from the evidence from the broader discipline of decision theory. Hastie and Dawes (2010) conclude that instinctive approaches are fruitful in non-optimal decision making conditions of all sorts: 'these efficient but non-optimal strategies may even be adaptively optimal in noisy, stressful and unforgiving environments' (2010:228). The non-optimal conditions they propose apply to many, if not most career decisions – the information is too vast or is incomplete, the outcome uncertain and the time for decision making limited, supporting the case to incorporate heuristic reason in career choice.

Evidence too exists (Dijkstehuis et al, 2006) that when the decisions are between multi-attribute options (i.e. a range of options which don't all have the same set of features, such as might be faced when comparing two jobs in different industries) the unconscious manages better because of its remarkable computational power. Their supposition is that for any complex intellectual task, the unconscious should out-perform the conscious.

Implications for practice

The research into the processes underpinning career decision making is limited, and our understanding of how good career decisions are made, still more so. But even the incomplete grasp we have serves to highlight that some of the conventions that have long been held true in career practice, should be questioned. I highlight here six common practices or assumptions which current evidence suggests could be questioned.

1. **We don't need to teach decision making processes.** As I mentioned above, the decision making element of career learning programmes tends to focus on the factors which contribute to career decisions, and rarely on the skills needed to hone the cognitive processes required. The evidence presented in the article could indicate that the best decisions are made through the gut instinct of skilled decision makers. One useful focus for career education could be to find ways to enhance decision making powers of our clients.
2. **Rational decisions are likely to be better ones.** The evidence illustrates clearly that the gut instinct has the potential to make at the very least, a positive contribution to effective career decision making. Understanding that instinctive judgements have an important contribution to make to the career decision making process could lead to practitioners encouraging clients to make good use of their unconscious insights.
3. **It is possible to ignore the gut instinct.** Our intuition is automatic and instantaneous and as a consequence we can't control it and we can't switch it off. Acknowledging the inevitability of clients' intuitive responses might lead to insightful career conversations, as a focus on the unconscious process could allow clients to articulate and evaluate the quality of their instinctive reason.
4. **Information is a pre-requisite to opinion.** Most career education assumes that information is the starting point for any career decision. As we saw above, we can have unconscious reactions to stimulus that we don't think we know anything about. Practitioners might usefully

open conversations by trying to ascertain clients' emotional reactions to particular occupations, before information is introduced.

5. **Our conscious minds have an accurate understanding of the decision making processes at play.** Research into motivated reasoning illustrates that our conscious minds are not always fully cognisant of the processes at play, attributing decisions made by System 1 reasoning to System 2 logic. Career practitioners could initiate fruitful conversations about their intuitive and emotional reasons even with clients who articulate sound rational reasons for their choices.

Conclusion

The processes by which we make career decisions have been much neglected in literature and, arguably, practice. In this article, I have summarised some of the relevant research into this arena, and stressed that the unconscious processes should not be ignored. The application of decision theory to the careers arena is very much in its infancy and further research is needed to allow us to understand the mechanism at play, the consequences of these mechanisms, and the implications for practice. The evidence, however, even as it stands, can usefully encourage us to question our assumptions, and to foreground career decision making processes in career conversations.



References

- Barnes, A., Bassot, B. and Chant, A. (2013) *An Introduction to Career Learning and Development* 11- 19 Hove: Routledge.
- Bimrose, J. and Barnes, S.A. (2007) Styles of career decision making. *Australian Journal of Career Development*, 16, 2, 20-28.
- Blustein, D.L. and Strohmer, D.C. (1987) Vocational hypothesis testing in career decision making. *Journal of Vocational Behavior*, 31, 45-62.

'The heart has its reasons that reason knows nothing of'...

- Bright, J., and Pryor, R. (2005) The chaos theory of careers: A user's guide. *The Career Development Quarterly*, 291-305.
- Browning, G., Halcli, A. and Webster, F. (2000) *Understanding contemporary Society: Theories of the Present* New York: Sage.
- Brownstein, A.L. (2003) Biased predecision processing. *Psychological Bulletin*, 129, 4, 545 – 568.
- Chaiken, S. and Trope, Y. (1999) *Dual-process theories in social psychology*. New York: Guilford Press.
- Cohen, C. E. (1981) Person categories and social perception: Testing some boundaries of the processing effects of prior knowledge. *Journal of Experimental Social Psychology*, 40, 441–452.
- Cohen, J.D., Dunbar, K. and McClelland, J.L. (1990) On the control of automatic processes: A parallel distributed processing account of the stroop effect *Psychological Review*, 97, 332-361.
- Damasio, A.R. (1994) *Descartes' Error: Emotion, reason and the human brain* New York: Putman.
- Denes-Raj V. and Epstein, S. (1994) Conflict between intuitive and rational processing: when people behave against their better judgement. *Journal of Personality and Social Psychology* 66, 5, 819-829.
- Dijksterhuis, A., Bos, M.W., Nordgren, L.F. and van Baaren, R.B. (2006) On making the right choice: The deliberation-without-attention effect. *Science*, 311, 1005-1007.
- Epstein, S. (1994) Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, 49, 709- 724.
- Evans, J.S.B.T. (2008) Dual processing accounts of reasoning, judgment and social cognition. *Annual Review of Psychology*, 59, 255-278.
- Ferreira, M.B., Garcia-Marques, L., Sherman, S.J. and Sherman, J.W. (2006) Automatic and Controlled Components of Judgment and Decision Making. *Attitudes and Social Cognition* 91, 5, 797–813.
- Fiske, S.T. and Taylor, S.E. (1991) *Social Cognition*. New York: McGraw Hill.
- Gati, I. (1986) Making career decisions: A sequential elimination approach. *Journal of Counseling Psychology*, 33, 4, 408–417.
- Gati, I., Krausz, M. and Osipow, S.H. (1996) A taxonomy of difficulties in career decision making. *Journal of Counseling Psychology*, 43, 510-526.
- Gati, I., Landman, S. Davidovitch, S., Asulin-Pretz, L. and Gadassi, R. (2010) From career decision making styles to career decision making profiles: a multi-dimensional approach. *Journal of Vocational Behavior* 76, 2, 277-291.
- Gigerenzer, G. (2007) *Gut Instinct*. London: Penguin Books.
- Gigerenzer, G., Todd, P.M. and the ABC Research Group (1999) *Simple heuristics that make us smart*. New York: Oxford University Press.
- Gilbert, D.T. (2002) Inferential correction. In T. Gilovich, D. Griffin, and D. Kahneman (Eds.) *Heuristics & biases*. New York: Cambridge University Press.
- Greenbank, P. (2009) Foundation degree students and their educational decision-making. *Education and Training* 51, 4, 259-271.
- Griffin, D., Gonzalez, R. and Varey, C. (2001) The heuristics and biases approach to judgment under uncertainty. In A. Tesser and N. Schwarz (Eds.) *Blackwell handbook of social psychology: Intraindividual processes*. London: Blackwell.
- Hastie, R. and Dawes, R.M. (2010) *Rational Choice in an uncertain world: The psychology of judgment and decision making*. London: Sage.
- Holland, J. L. (1985) *Making vocational choices: A theory of careers* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Holland, J. L. (1997) *Making vocational choices* (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc.
- Homans, G. (1961) *Social Behaviour: its elementary forms*. London: Routledge and Kegan Paul.
- Huber, J. and Puto, C. (1983) Market Boundaries and Product Choice: Illustrating Attraction and Substitution Effects. *Journal of Consumer Research*, 10 31-44.
- Ibarra, H. (1999) Provisional Selves: Experimenting with Image and Identity in Professional Adaptation. *Administrative Science Quarterly*, 44, 764-791.

- Ito, T.A. and Cacioppo, J.T. (1999) The psychophysiology of utility appraisals. In D. Kahneman, E. Diener and N. Schwarz (Eds.), *Well being: The foundations of hedonic psychology*. New York: Russell Sage Foundation.
- Kahneman, D. (2003) A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58, 697-720.
- Kahneman, D. and Frederick, S. (2002) Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin and D. Kahneman (Eds.), *Heuristics and Biases*. New York: Cambridge University Press.
- Krieshok, T.S., Black, M.D. and McKay, R.A. (2009) Career Decision Making: The limits of rationality and the abundance of non-conscious processes. *Journal of Vocational Behavior* 75, 3 275-290.
- Law, B. and Watts, A.G. (1977) *Schools, Careers and Community* London: Church Information Office.
- Le Doux, J.E. (1996) *The emotional brain: the mysterious underpinnings of emotional life*. New York: Simon and Schuster.
- Mikels, J.A., Maglo, S.J., Red, A.E. and Kaplowitz, L.J. (2011) Should I go with my gut? Investigating the benefits of emotion focused decision making. *Emotion*, 11 (4) 743-753.
- Nisbett, R.E. and Wilson, T.D. (1977) Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.
- Office of National Statistics (2010) *SOC Codes*. London: ONS.
- Payne, J.W., Bettman, J.R. and Johnson, E. (1993) *The adaptive decision maker*. Cambridge: Cambridge University Press.
- Pitz, G.F. and Harren, V.A. (1980) An analysis of career decision making from the point of view of information processing and decision theory. *Journal of Vocational Behavior*, 16 320-346.
- Phillips, S.D. (1997) Toward an expanded definition of adaptive decision making. *The Career Development Quarterly*, 45, 275-287.
- Rolls, E.T. (1999) *The brain and emotion*. New York: Oxford University Press.
- Rumelhart, D. E. (1984) Schemata and the cognitive system. In R. S. Wyer and T. K. Srull (Eds.) *Handbook of social cognition*. Mahwah, NJ: Erlbaum.
- Savickas, M. (2005) The theory and practice of career construction. In Brown, S.D. and Lent, R.W. (Eds.) *Career Development and Counseling: putting theory and research to work*. New Jersey: Wiley and Sons Inc.
- Schein, E. H. (1990) *Career Anchors (discovering your real values)*. Jossey-Bass Pfeiffer, San Francisco.
- Singh R. and Greenhaus J.H. (2004) The relation between career decision-making strategies and person-job fit: A study of job changers. *Journal of Vocational Behavior*, 64 (1) 198-221.
- Slovic, P., Finucan, M.L., Peters, E. and MacGregor, D.G. (2002) The affect heuristic. In T. Gilovich, D. Griffin, and D. Kahneman (Eds.) *Heuristics and Biases: The psychology of intuitive judgment* (pp397-420). New York: Cambridge University Press.
- Soelberg, P.O. (1967) Unprogrammed decision making. *Industrial Management Review*, 8 19-29.
- Stanovich, K. E. and West, R. F. (2000) Advancing the rationality debate. *Behavioral and Brain Sciences*, 23, 701-726.
- Super, D. E. (1980) A life-span, life-space approach to career development. *Journal of Vocational Behavior*, 16, 282-298.
- Tversky, A. and Kahneman, D. (1974) Judgment under uncertainty: Heuristics and biases. *Science* 185, 1124-1131.
- Zajonc, R.B. (1980) Feeling and Thinking: Preferences need no inferences. *American Psychologist*, 35, 151-175.

For correspondence

Julia Yates,
Senior Lecturer,
University of East London

j.c.yates@uel.ac.uk