

our minds work associatively: this is of central importance for psychotherapy & for life in general

(this handout, with links to all research, was posted to www.stressedtozest.com on 12.12.12)

In his brilliant book *"Thinking, fast and slow"* published last year, the Nobel Prize winner Daniel Kahneman says his aim is to help improve our *"ability to identify and understand errors of judgement and choice ... (and) ... to limit the damage that bad judgements and choices often cause."* The New York Times review commented *"A major intellectual event ... a crucial pivot point in the way we see ourselves"*, while the Financial Times went even further, stating *"There have been many good books on human rationality and irrationality, but only one masterpiece. This is one of the greatest and most engaging collections of insights into the human mind I have read."* A recurring theme in the book is Kahneman's distinction between what he calls two modes of thinking, but they might be better described not only as two modes of thinking but also of feeling, interpreting & reacting to the world. One is fast, automatic, intuitive & associative; the other slow, effortful, rational & sequential. They are both active whenever we are awake. Kahneman writes *"System 1 runs automatically and System 2 is normally in a comfortable low-effort mode, in which only a fraction of its capacity is engaged. System 1 continuously generates suggestions for System 2: impressions, intuitions, intentions, and feelings. If endorsed by System 2, impressions and intuitions turn into beliefs, and impulses turn into voluntary actions. When all goes smoothly, which is most of the time, System 2 adopts the suggestions of System 1 with little or no modification. You generally believe your impressions and act on your desires, and that is fine – usually."*

The book is the fruit of a lifetime of research by Daniel Kahneman and his long-time collaborator, Anton Tversky. Their famous, ground-breaking 1974 paper – *"Judgment under uncertainty: Heuristics and biases"* – is reprinted in full in the appendix of *"Thinking, fast and slow"*. So too is their linked 1984 paper *"Choices, values, and frames"*. And Kahneman is still mining these rich research themes – see, for example, his 2009 paper *"Conditions for intuitive expertise: A failure to disagree"*. Interestingly, Kahneman & colleagues were publishing on the relevance of this work to health care back in 1993 – *"Understanding patients' decisions. Cognitive and emotional perspectives"*. This was the same year that the brilliant researcher John Teasdale applied these ideas to psychotherapy in his paper *"Emotion and two kinds of meaning: cognitive therapy and applied cognitive science"* with its abstract reading *"The clinical cognitive approach assumes that emotional reactions are mediated through the meanings given to events. Cognitive therapy aims to change emotion by changing meanings. It focuses on specific level meanings, evaluating the truth value of particular beliefs ... This focus on meaning at a specific level causes problems, e.g. the contrasts between 'intellectual' and 'emotional' belief, between 'cold' and 'hot' cognition, and between explicit and intuitive knowledge ... holistic level meanings are of primary importance in emotion production. Representations at this level consist of schematic mental models, encoding high-order inter-relationships and prototypical patterns extracted from life experience ... (this) suggests a therapeutic focus on holistic rather than specific meanings, a role for 'non-evidential' interventions, such as guided imagery, and a rational basis for certain experiential therapies."*

One of several things that I deeply appreciate about Kahneman's recent book *"Thinking, fast and slow"* is its superb description of the automatic, intuitive, associative *"thinking mode"*. He writes: *"To begin your exploration of the surprising workings of System 1, look at the following words:*

Bananas

Vomit

[Cont.]

A lot happened to you in the last second or two. You experienced some unpleasant images and memories. Your face twisted slightly in an expression of disgust, and you may have pushed this book imperceptibly farther away. Your heart rate increased, the hair on your arms rose a little, and your sweat glands were activated. In short, you responded to the disgusting word with an attenuated version of how you would react to the actual event. All this was completely automatic, beyond your control.

There was no particular reason to do so, but your mind automatically assumed a temporal sequence and a causal connection between the words 'bananas' and 'vomit', forming a sketchy scenario in which bananas caused the sickness. As a result, you are experiencing a temporary aversion to bananas (don't worry, it will pass). The state of your memory has changed in other ways: you are now unusually ready to recognize and respond to objects and concepts associated with 'vomit', such as sick, stink, or nausea, and words associated with 'bananas', such as yellow and fruit, and perhaps apples and berries.

Vomiting normally occurs in specific contexts, such as hangovers and indigestion. You would be unusually ready to recognize words associated with other causes of the same unfortunate outcome. Furthermore your System 1 noticed the fact that the juxtaposition of the two words is uncommon; you probably never encountered it before. You experienced mild surprise.

This complex constellation of responses occurred quickly, automatically, and effortlessly. You did not will it and you could not stop it. It was an operation of System 1. The events that took place as a result of your seeing the words happened by a process called associative activation: ideas that have been evoked trigger many other ideas, in a spreading cascade of activity in your brain. The essential feature of this complex set of mental events is its coherence. Each element is connected, and each supports and strengthens the others. The word evokes memories, which evoke emotions, which in turn evoke facial expressions and other reactions, such as a general tensing up and an avoidance tendency. The facial expression and avoidance tendency intensify the feelings to which they are linked, and the feelings in turn reinforce compatible ideas. All this happens quickly and all at once, yielding a self-reinforcing pattern of cognitive, emotional, and physical responses that is both diverse and integrated - it has been called 'associatively coherent'.

In a second or so you accomplished, automatically and unconsciously, a remarkable feat. Starting from a completely unexpected event, your System 1 made as much sense as possible of the situation - two simple words, oddly juxtaposed - by linking the words in a causal story; it evaluated the possible threat (mild to moderate) and created a context for future developments by preparing you for events that had just become more likely; it also created a context for the current event by evaluating how surprising it was. You ended up as informed about the past and as prepared for the future as you could be.

An odd feature of what happened is that your System 1 treated the mere conjunction of two words as representations of reality. Your body reacted in an attenuated replica of a reaction to the real thing, and the emotional response and physical recoil were part of the interpretation of the event. As cognitive scientists have emphasized in recent years, cognition is embodied; you think with your body, not only with your brain.

*The mechanism that causes these mental events has been known for a long time: it is the association of ideas ... I will adopt an expansive view of what an idea is. It can be concrete or abstract, and it can be expressed in many ways: as a verb, as a noun, as an adjective, or as a clenched fist. Psychologists think of ideas as nodes in a vast network, called associative memory, in which each idea is linked to many others. There are different types of links: causes are linked to their effects (virus to cold); things to their properties (lime to green); things to the categories to which they belong (banana to fruit) ... we no longer think of the mind as going through a sequence of conscious thoughts, one at a time. In the current view of how associative **[Cont.]***

memory works, a great deal happens at once. An idea that has been activated does not merely evoke one other idea. It activates many ideas, which in turn activate others. Furthermore, only a few of the activated ideas will register in consciousness; most of the work of associative thinking is silent, hidden from our conscious selves. The notion that we have limited access to the workings of our minds is difficult to accept because, naturally, it is alien to our experience, but it is true: you know far less about yourself than you feel you do."

Fascinating. So much that is relevant here. For example, it's not that Kahneman is denying the sometimes stunningly helpful power of intuition ... he does however help us be cautious. So the abstract of his 2009 paper – *"Conditions for intuitive expertise: A failure to disagree"* – reads *"This article reports on an effort to explore the differences between two approaches to intuition and expertise that are often viewed as conflicting: heuristics and biases (HB) and naturalistic decision making (NDM). Starting from the obvious fact that professional intuition is sometimes marvellous and sometimes flawed, the authors attempt to map the boundary conditions that separate true intuitive skill from overconfident and biased impressions. They conclude that evaluating the likely quality of an intuitive judgment requires an assessment of the predictability of the environment in which the judgment is made and of the individual's opportunity to learn the regularities of that environment. Subjective experience is not a reliable indicator of judgment accuracy."*

And of course, as John Teasdale has long pointed out – an understanding of associative, intuitive thinking is potentially so helpful for psychotherapy. It's worth repeating Kahneman's comment *"An odd feature of what happened is that your System 1 treated the mere conjunction of two words as representations of reality. Your body reacted in an attenuated replica of a reaction to the real thing, and the emotional response and physical recoil were part of the interpretation of the event. As cognitive scientists have emphasized in recent years, cognition is embodied; you think with your body, not only with your brain. The mechanism that causes these mental events has been known for a long time: it is the association of ideas ... I will adopt an expansive view of what an idea is. It can be concrete or abstract, and it can be expressed in many ways: as a verb, as a noun, as an adjective, or as a clenched fist. Psychologists think of ideas as nodes in a vast network, called associative memory, in which each idea is linked to many others."* This throws fresh light on the potential value of so many aspects of psychotherapy – mindfulness practice, many uses of imagery, focusing, reappraisal, exposure/desensitization therapies, implementation intentions, and the therapeutic relationship to name but a few. As Einstein wrote *"It is the theory that decides what can be observed"* and Kurt Lewin famously commented *"There is nothing so practical as a good theory"*.
