

Intuition in clinical decision-making: a psychological penumbra

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The notion of intuition and its use in complex clinical decision-making has, over the years, created points of debate, discussion and tension (Benner, 1984; Benner and Tanner, 1987; English, 1993; Darbyshire, 1994; Paley, 1996; Thompson, 2003; Paley, 2006; Parahoo, 2006; Paley et al, 2007). This situation has arisen partly due to the fact that intuition as a concept is difficult to grasp. In this commentary, the term ‘intuition’ is used to refer to a form of knowing and behaving which is not based on rational reasoning (Parahoo, 2006). In other words, intuition is knowing without knowing how one knows.

Another reason for the ongoing debate on the use of intuition in clinical practice is that it is difficult to underpin how intuition informs clinical decision-making. It is from such lack of explanation that intuition was, and according to some, is still considered a result of our ‘sixth sense’.

Recent developments in psychological research make it possible to understand more and explain better the basis of intuition. Such insight will arguably make the role that intuition plays in clinical decision-making more transparent. This is an important step towards the empirical validation of intuition in today’s nursing profession that is attempting to develop a research base to support its actions (English, 1993; Kennedy and Lockhart-Wood, 2005).

There are many previous psychological publications on intuition, discerning its wisdom and fallibility and demonstrating its powers and perils; see for example Myers (2002) for an accessible introduction on this topic.

For purposes of this article, we present and restrict our comments to two key psychological research studies relating to intuition. These two studies will demonstrate:

- The role of unconscious thought in intuitive decision-making
- The physiological basis of intuition.

Our aim is to show, in a small way, how research has helped to explain the way intuition functions and the relevance of these findings to

Abstract

Aim: To demonstrate the link between intuition and cognitive as well as physiological processes as a way of helping to explain how intuition plays a part in complex decision-making.

Background: Over the years, numerous debates and discussions have raged about how intuition contributes to the making of complex clinical decisions. Intuition continues to be poorly understood, and in some cases, it is still considered the work of our sixth sense. Although experts make accurate intuitive decisions, they are not always able to articulate how they have arrived at a particular decision.

Method: We use two scientific experiments to demonstrate how research has helped to explain the cognitive and physiological functions of intuition in relation to complex decision-making. We discuss the role of unconscious thought in intuitive decision-making. Finally, we show that intuition can be a valuable component of expert practice.

Conclusion: Intuition has traceable cognitive and physiological bases that help us understand how we use it as a basis for making complex clinical decisions. Experts, especially those working in acute and palliative care, where there are difficult ethical as well as clinical patients situations, can benefit from using intuitive ideas to arrive at complex decisions.

nursing practice and decision-making. We intend to demonstrate that intuition can be a valuable component of expertise in complex clinical decision-making. Such decisions are important mainly where there are complex patient needs as often encountered in acute and palliative care settings. In particular, the end of life in palliative care is fraught with ethical as well as clinical dilemmas, which can benefit from intuitive judgments and decision-making.

The notion of intuition

As long as people have no rational explanation of a phenomenon, they tend to turn to supernatural elucidations. For example, it was once thought that it was the wrath of the ‘God Poseidon’ that caused earthquakes and tidal waves. Today, some commentators still believe, in a mysterious way, that intuition causes deep understanding of the total situation (Smith, 2007). This would make ‘intuition’ a scientific

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‘The superiority of unconscious thinking over conscious thinking with regard to complex situations can lead to better decision-making for expert nurses’

terra incognita; a term used here only to describe an area of knowledge as yet unknown. However, by gradually uncovering and understanding the elements underpinning intuition, less and less will remain hidden about it. Therefore, it is logical to suggest that, eventually, this terra incognita will be completely and clearly mapped out and demystified. As was the case with Poseidon’s earthquakes and tidal waves, it will equally turn out that there is nothing mystical or paranormal about intuition after all. The description of intuition as a ‘hunch’ or ‘sixth sense’ suggests how difficult it is to explain how intuition actually functions.

The following section will present two examples of psychological experiments to demonstrate how the terra incognita of intuition is being mapped out. This mapping out will hopefully help with our understanding of how intuition functions. First, we discuss the link between intuition and cognitive processes of unconscious thought.

Intuition and unconscious thought theory

The unconscious thought theory (Dijksterhuis and Nordgren, 2006) can be related to intuition and is based on research by Dijksterhuis and colleagues (see Dijksterhuis, 2004; Dijksterhuis and Nordgren, 2006). There are also a lot of previous studies in this area (e.g. Lewicki et al, 1992; Sloman, 1996; Claxton, 1997; Smith and DeCoster, 1999; Lieberman, 2000; Wilson, 2002).

The first experiment we present is one that Dijksterhuis (2004) used to underpin his unconscious thought theory. In this experiment, participants were given information about four hypothetical dwelling apartments. Each apartment was described by 12 different attributes adding up to a total of 48 pieces of information presented in random order. One of the four apartments was made more desirable than the other three. After participants had read the rather daunting amount of information, they were asked to evaluate each individual apartment and to select one apartment they most preferred. This was done under one of three conditions:

1. Participants did it immediately after having read the information
2. Participants were given three minutes to consciously think about it first
3. After participants were told they would be quizzed about the apartments later, they were distracted for three minutes with a task preventing conscious thought activity on the apartment, thereby enabling only unconscious thought to operate.

The result was that participants who had to choose immediately or who were engaged in conscious thought did not, on average, indicate greater liking for the desirable apartment. Only the unconscious thinkers (condition 3) reported the appropriate preference for the desirable apartment. They performed significantly better than the conscious thinkers (under condition 2) and the immediate choosers (under condition 1). For more detail on the study see Dijksterhuis and Nordgren (2006).

The theory of unconscious thought can be true and especially relevant for expert nursing where nurses receive a lot of information simultaneously and end up processing some of it unconsciously. The superiority of unconscious thinking over conscious thinking with regard to complex situations can lead to better decision-making for expert nurses. The theory of unconscious thought becomes an important cornerstone when trying to map out the more cognitive component of intuition.

Unconscious and conscious thought process

The theory of unconscious thought distinguishes between two modes of thought: unconscious and conscious. Both types of thought have different characteristics that make each mode preferable under different circumstances. For instance, contrary to popular belief, decisions about simple issues are better ‘tackled’ using conscious thought, whereas decisions about complex matters are better approached using unconscious thought (Dijksterhuis and Nordgren, 2006). This can be explained if we believe that conscious thought is constrained by the low capacity of consciousness, so by necessity, performance uses only a subset of the information that is potentially available. This capacity principle dictates that conscious thought will not help make effective decisions in very complex circumstances, as often found within ‘expert or specialist’ nursing. The unconscious thought is capable of detecting recurring patterns (paradigm cases), even if these are highly complicated (Dijksterhuis and Nordgren, 2006). Again, it can be argued that highly complicated and recurring patterns are common within ‘expert/specialist’ nursing, making the argument for the use of unconscious thought relevant and appropriate in specialized areas of practice like palliative care and acute settings.

For the unconscious thought to be able to show its ‘superiority’ over conscious thought, it is important that the unconscious has access to all important data information (Dijksterhuis and

Nordgren, 2006). To benefit the capacity principle, a lot of data have to be 'in store'. This is where the more experienced nurse demonstrates more expertise over the novice nurse, as she arguably has much more information stored in her memory that the unconscious thought can process. This example is true of other disciplines like medicine, physiotherapy or engineering. As long as the amount of information that can be used for decision-making is limited (as could be the case for a novice), conscious thinking is adequate if not superior to unconscious thinking.

So to recap, only by having more experience (with more data stored) does it become possible to benefit from unconscious thinking where decisions made can reach an expert level.

We now present the second study that demonstrates the link between intuitive decision-making and physiological process within individuals.

Intuition and physiology

The second example is based on the Iowa gambling experiment conducted by Bechara et al (1997). In this experiment, people were asked to play a simple gambling game. They were given a loan of \$2 000 facsimile US dollars. They could choose red or blue cards and each card would either win or lose them a sum of money. Their job was to decide and turn over cards in such a way that their gambling winnings were maximized. The researchers asked the gamblers two questions (and audio-taped responses) at ten-card intervals to gauge level of awareness of what was happening in this 'game'. The questions were: 'Tell me all you know about what is going on in this game' and 'Tell me how you feel about this game'.

However, what they did not know at the beginning was that turning red cards carried a penalty and therefore lost them money. Overall, they could only win by turning over the blue cards. The researchers observed how long it took for the participants to realize this. It was found that after people had turned over about 50 cards, most started to develop a hunch about what was going on. After turning over about 80 cards, most people had figured out the game, and could explain exactly why the red cards were a financial disaster. That is the way learning takes place. The Iowa scientists also discovered the link between intuitive functioning and physiological changes within the gamblers. They hooked each gambler up to a polygraph that measured the activity of the sweat glands below the skin in the palms of the hands. These sweat glands respond to stress and are viewed as messengers from their autonomic nervous system. The scientists in this

experiment found that gamblers started generating stress responses to red cards by the tenth card, although when asked the two questions above, they were not consciously aware of what was happening. More importantly, from that moment on, they started favouring the blue cards, without being consciously aware of it. In other words, the autonomic nervous system was already sending messages about a strategy to follow long before people were consciously aware of what adjustments they should make (Bechara et al, 1997). The gambling experiment helps to us understand the physiological component of intuition and the decision-making process.

The relevance of this experiment for nursing can be demonstrated by looking at some nursing studies on intuition. Several studies using both quantitative and qualitative approaches, for example, (Pyles and Stern, 1983; Isenberg, 1984; Rew, 1988b; Agor, 1989; Kelly, 1994; Contino; 1996, Davis-Floyd and Davis, 1996; Khatri and Ng, 2000; McCutcheon and Pincombe, 2001) tend to link intuition to gut feeling.

In a grounded theory study by Pyles and Stern (1983), experienced nurses detected cardiogenic shock in patients with myocardial infarction through gut feelings. As Smith et al (2004) argue, there are other ways to perceive information physically from the environment. It is suggested by Rew (1988a) that chills down the spine, headaches and muscle tightness can occur when intuitive functioning is identified. In these circumstances, experienced nurses describe postural tightness, restlessness, general uneasiness, increased heart rate, racing blood flow, stomach tightness, and 'all senses turned on' (Rew, 1988a). This is intuition presenting at a physical level. When there appears to be no logical explanation for intuition, people tend to call this experience an 'inner voice', not realising that there is a physiological explanation for it.

Throughout the abdomen, extensive nervous system cells form part of our autonomic nervous system. The complex circuitry in the abdomen looks very similar to a brain; with the same cell types and neurotransmitters operating. This enteric nervous system shows an anatomical and functional independence from the brain and the spinal cord (Gershon, 1998). We can not formally think with this system but our feelings and experiences can be 'remembered' and recalled. Hanifl and Langbein (2005) call this our 'Bauchhirn' (belly brain) as opposed to our 'Kopfhirn' (head brain). These two brains have a permanent connection, without us being aware of it. Our 'belly brain' is much more communicative than our 'head brain': nine out of ten bits

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of information go from the ‘belly brain’ to the ‘head brain’. The response of different viscera to distinct, emotion-specific patterns of autonomic output is fed back to the head brain. Even though this process unfolds largely without conscious awareness, it plays an important role in emotional function and may influence rational decision-making (Mayer et al, 2000). According to Damasio (1994; 1999; 2003), somatic markers form the basis of the unconscious, automatic system that has been called ‘intuition’.

Somatic markers are neural representations of body states that guide decision-making by colouring behavioural options with affective significance. The head brain continually receives signals from the body that provides an ongoing backdrop. When these signals result in changes to the head brain’s map of the body, a conscious feeling is experienced. Therefore, we can automatically respond to stimuli in new situations based on past experiences. This is what our ‘gut level’ is, a non-cognitive way of knowing. Bechara et al (1997) already suspected that the autonomous responses they detected were evidence for a complex process of non-conscious signaling, which reflects access to records of previous individual experience – specifically of records shaped by reward, punishment, and the emotional state that attends them. In psychology this is referred to as conditioning; a process by which situations and emotions are being linked. When nurses have a ‘gut level feeling’ that something is wrong with a patient then probably their ‘belly brain’ recognizes a situation or pattern that (in previous experience) proved to be dangerous or fatal if not acted on. While the reaction is instantaneous, the delay is experienced in how that information is relayed to the head brain, and that is why in most instances nurses or those who have made an instinctive/intuitive decision are unable to articulate how they ‘figured out’ the deteriorating (dangerous/fatal) situation in a patient’s condition.

Discussion

The studies presented above demonstrate how intuition can be a valuable component in clinical decision-making. An advantage of developing a better understanding of the mechanisms underlying intuition could be that we will have more points of application with regard to developing, educating and making maximum use of the powers of intuition. More experienced nurses in particular can benefit from their intuitive powers in order to function at an expert level. As Benner et al (1996) claimed, experts see the unexpected, and that which is beyond

the immediate clinical situation – the bigger picture. Nurses at the height of their expertise become perceptive to distinctions and similarities in patient situations. This perceptive grasp is highly personal and depends very strongly on particular previous situations encountered, leading to the formation of paradigm cases. As a result, experienced nurses have more data in store than can be processed consciously. There is a lot to be gained by reflecting and ‘listening’ to the outcomes of their unconscious thought processes and physical signals as manifestations of their intuition.

However, it is important to acknowledge that even the strongest intuition is sometimes fallible when put to empirical test (Polgar and Thomas, 1991). The cautionary point to emerge here is that intuition should not be measured or judged like empirical evidence, as it requires a different type of ‘understanding’. However, this should not be taken to mean that intuition is not a valuable source of knowledge, but that it can be used as a component of decision-making processes which should be complemented with information from other sources of knowledge whenever possible. Some nursing situations demand other types of evidence such as research evidence, empirics, aesthetics, ethics and personal knowledge (Carper, 1978; White, 1995). Both Carper and White give detailed accounts of the fundamental patterns of knowing in nursing, and interested readers are referred to their publications. For a more detailed theoretical analysis of these ways of knowing, readers are referred to Paley et al’s recent paper (see Paley et al, 2007).

Conclusion

Intuition is knowing without knowing how one knows. This view is held because ‘intuitive ideas’ are the product of unconscious processes. The use of unconscious thought can lead to valuable ideas that might not have emerged if one relied solely on conscious thinking. On the other hand, it should be acknowledged that even the strongest intuition can also be fallible at times. Such fallibility is also common in other sources of knowledge like rationality and or empirical evidence. Therefore, intuitive ideas should on one hand be taken seriously and be treated as hypotheses of what could be going on in a clinical situation. On the other hand they should always be checked or complemented with information from other (more rationally based) sources of knowledge whenever and as much as possible. In this way, the strengths of unconscious processes and conscious thinking can be

combined to maximize complex clinical decision-making processes to the benefit of patient situations. Clinical settings like palliative and acute care, where ethical as well as complex clinical decisions are often made can benefit from such a combination.

We hope we have shown, in a small way, how research has helped to explain the cognitive and physiological way that intuition functions in decision-making. From this, it is concluded that intuition can make a valuable contribution to complex clinical decision-making. Intuition can be seen as a psychological penumbra bringing messages across from the dark unconscious to the enlightened conscious, waiting for its voice to be heard. 

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Key words

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