Feeling and knowing: neural scientific perspectives on intuitive practice


Summary
This article re-evaluates the place of intuition in the hierarchy of nursing skills in the light of recent neuro-scientific findings. The author draws on neural scientific perspectives to clarify ambiguity associated with intuition and redefine it as a working concept. Fresh credence is attributed to the previous claims of practitioners, theorists and other proponents of hypothetico-deductive approaches. Gender advantage in the use of emotional intelligence in professional life is critically explored. Arguments are tabled for a conceptual framework to house, guide and shape intuition in practice.

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INTUITION IS DEFINED as the ‘immediate apprehension of the mind without intervention of reasoning; direct or immediate insight’ (Thompson 1998).

Intuitive practice has been hailed as the product of eclectic experiential learning and the hallmark of the expert practitioner (Benner and Tanner 1987, King and Appleton 1997). At the same time, such approaches to practice have provoked fierce debate in the literature. Some authors have dismissed intuitive judgement as unscientific and lacking in an evidence base, calling it a ‘subjective and questionable entity’ (English 1993). Walsh (1997) agrees, adding that nurses relying on intuitive judgement would be placed in an invidious position if asked to justify their actions in a legal forum. This view has been strengthened by the absence of a consensus on the definition of intuition (Appleton and Cowley 2003). Paley (1996) takes a more neutral stance but challenges the protagonists of intuitive practice to make clear distinctions between intuition and prejudice, habit, extrasensory perception and whim. She also asks whether intuitive practice can be learned or shared.

To address these issues it is necessary to explore beyond the boundaries of established nursing research and theory, and examine the contribution of neuroscience and cognitive imaging technology.

Literature review
Smolensky (1988) argued that as an individual’s learning pathway in any field of knowledge evolves from that of a novice to an expert, specialised neural connections are made between a repertoire of potentially required responses and familiar patterns. These patterns act as cues and are conveyed to the memory banks by the five special senses. As these neural networks develop, layers of conscious rule-following behaviour are gradually rendered redundant. The number, variety and sophistication of these responses, together with the speed with which they are delivered, increase with the expertise and experience of the individual as does the expanse of the pattern response matrix. Where areas of knowledge and expertise are associated or overlap, for example, in chemistry and engineering, pattern response matrices form corresponding connective networks. In this way,
Smolensky’s work is all the more credible following the findings of Bechara et al (1997) who, in a large comparative study, observed the decision-making behaviour patterns of two groups of participants. The members of the first group had decision-making defects because they had pre-frontal lobular damage to the brain. The second group were termed ‘normals’ as they had no such damage. Both groups were allocated a series of identical tasks requiring analysis and problem solving in which they had no previous experience. The second group showed far greater anticipation, speed and agility in decision making and problem solving than the first, suggesting a definite role for subconscious recall of pattern recognition in the prefrontal cortex relating to praxis. However, the relationship between cognition and emotion is crucial to explain intuitive thought.
Damasio (2000) developed Bechera et al’s (1997) findings in parallel research. Damasio, initially assisted by Christen (Damasio et al 1996), highlighted the role of the amygdala or amygdaloid nucleus, situated in the medial temporal lobe of the brain adjacent to the hippocampus (Figure 1), in storing context-related information on emotion relayed via the thalamus, processing meaning and transmitting this to the higher centres of reasoning and memory banks via the hippocampus.
Damasio et al’s (1996) pioneer methods of combining psychological tests with neural imaging and tracking revealed that the amygdala synapses with the five special sense centres and can therefore respond emotionally to all exogenous stimuli. While the hippocampus is responsible for initiating memory storage, the amygdala plays a key role in emotional interpretation. The amygdala is responsible for indirectly retriggering emotion-associated behavioural responses to external stimuli that have been experienced in the past but which are dormant in the subconscious (Roberts et al 1998). This interface between emotion, response and reasoning is milliseconds in duration but the emotional message is 10 milliseconds shorter. In other words: we feel before we think (Panksepp 1998).
The relationship between thoughts and feelings, emotion and cognition is far more seamless than previously thought. The amygdala indirectly influences higher cognitive centres through the arousal system and has been linked to producing optimum performance. Cognitive and emotional systems do not share a relationship of commutative equivalence, that is, there are far more efferent nerves than afferent nerves connecting the cognitive centres to the emotional ones. Emotions give rise to thoughts far more than thoughts give rise to emotions. Emotions stand at the helm of memory guidance, consolidation, storage and retrieval. Cognition is ‘emotion gated’. Thoughts and feelings together with the strategies they combine to formulate are the conscious generated virtual products of emotional subsystems. Feelings are powerful catalysts for reasoned activity while thoughts are not unless they stimulate emotional subsystems first. Emotions, therefore, constitute a powerful protective evaluation trigger mechanism. When dogged by a sudden and/or persistent feeling, it is significant of some recent or current noteworthy perhaps even life-threatening event which requires immediate attention and reflection, and which we ignore to the detriment of something or someone, possibly at our peril (Panksepp 1998, Borod 2000).
Implications for professional life

The literature has implications for theories of intuitive praxis at several levels, three of which are discussed in this article:

- Delineation and definition.
- Association and integration with current understanding.
- Credence.

The first level is delineation and definition. A number of major ambiguities regarding intuition, prejudice, whim, habit and extrasensory perception (ESP) can be addressed more positively at this level.

Intuition and prejudice

Prejudice can be defined as: ‘a preconceived opinion’ (Thompson 1998) based on limited experience and assumption and does not inspire optimum practice. It works against hypothesis formation and is closed to new possibilities. Prejudiced people who do not recognise themselves as such have no need of hypotheses. Their world is preserved intact and sealed from within, often for their own comfort, by the belief that knowledge is finite.

Intuitive thinking by contrast drives enquiry-based learning and when applied by a reflective practitioner creates the artistry that is professional practice (Schon 1987). Beecroft (1998) illustrates how concentration and reflection on a situation or set of concepts can generate a state of sudden awareness of a theoretical vacuum which moves the practitioner to explore further. The awareness state is often a nebulous emotional unease which evolves to become more easily articulated recognition. Such an approach forms part of a partnership with a range of other critical thinking skills, many of which act as safeguards against prejudicial thinking (Scheffer and Rubenfeld 2000).

Intuitive thinking housed in such a critically reflective mode permits isolation and re-examination of episodic components. Cues can be categorised. Roles, motives and heuristic origins can be ethically tested and traced to possible consequences (Buckingham and Adams 2000, Shaw 2001).

Intuition and whim

A whim, ‘a sudden unpredictable change of mind or conduct’ (Thompson 1998), may occasionally prove inspirational but unlike intuition it carries a voluntary and fleeting dynamic, and its roots cannot be traced through guided reflection. It also has by its very capricious nature a much stronger relationship with chance and spontaneous uninformed guesswork. The individual possessed by a whim is motivated by default in the absence of any rational directive information (Klein 2001). Intuitive thought, in contrast, is aroused by its subject-related relevance or situational ‘background understanding’ (Benner 1984) as perceived by the practitioner. The understanding arises when stimuli are conveyed via the amygdala to the hippocampus and memory banks of the cerebral cortex. Those centres in turn upload specific sapiential response pattern information to the cognitive consciousness of the practitioner (the process by which wisdom is used intuitively). This ‘arousal loop’ is what makes it theoretically possible to subject intuitive information to a reductive process using a structured framework. There is no evidence to suggest that capriciousness operates within such a neural network. However, it might be said that while the rationale in intuition is unseen rather than absent, the rationale for whim is simply absent.

Intuition and habit

Habit, ‘a settled or regular tendency; a mental constitution or attitude; an automatic reaction to a specific situation; a practice which is hard to give up’ (Thompson 1998), bears some behavioural relation to intuition through packaged pre-programming but it is not the same. Habit is thought to be associated with procedural memory systems: the cerebellum and the motor cortex, while intuitive thinking, emotions and semantics are more closely associated with declarative memory systems: the amygdala, diencephalon and prefrontal cortex (Tulving and Schacter 1990).

Habit is a useful mode of thinking by virtue of its automatic piloted operational function which releases higher levels of consciousness to concentrate on other areas of disciplined or undisciplined thought. However, its propensity for ritual means that rather than informing and interacting with the unpredictable demands of practice, habit fuels habitualisation and does not, therefore, inform contingency or facilitate innovation (Scheffer and Rubenfeld 1999). An extreme example of this is a patient with a dissociative or obsessive compulsive disorder arising from post-traumatic stress syndrome. In this patient the amygdala acts independently by short circuiting and producing a pre-programmed fast-tracked behavioural response to a repeated traumatic experience whether it is appropriate or not (Pollak et al 1998). Intuitive thought, on the other hand, while gated by emotion, arouses cortical awareness. This may or may not be consciously suppressed in the face of exogenous stimuli which, although previously encountered, form part of a whole uncharted situation.

Intuition and extrasensory perception

It is not within the scope of this article to attempt to establish the existence of ESP. However, it is clear that an understanding of intuition begins with a grasp of how knowledge is absorbed by the five special senses and retained by the subconscious.
ESP, however, requires belief in the ability to access information without the aid of these senses. Furthermore such information is claimed to originate in the past, present and, often in the case of premonitions, future (Gilovich 1991). ESP theory refers to a collective consciousness where the accumulative mass of human experience is stored and occasionally accessed by individuals. Intuition is centred on individual conscious experience and its relationship with that individual’s subconscious. ESP concerns individuals who claim to be able to access knowledge from a parallel universe. Intuition concerns individuals accessing knowledge from within.

The difference between the two concepts does not end there. This article aims to show that the evidence base to support intuition as a real, effective and credible part of professional practice is both eclectic and cogent. However, little scientific experimentation involving ESP has taken place. Of those experiments which have taken place in settings which could possibly be described as controlled, parapsychologists have struggled unsuccessfully to reproduce results which demonstrate abilities suggestive of ESP in excess of those which could be produced by chance (Milton and Wiseman 1999).

The second level is association and integration with current understanding. **Intuition and lifelong learning** Physiologically evidenced intuitive processes and emotion-gated cognition mean that the place of an affective domain in models of reflection and the role of motivation in experiential lifelong learning are further confirmed and clarified. Indeed, it has been demonstrated that such intuitive knowledge can be learned and shared whether through use of narrative or practicum and called interpretative phenomenology (Benner 1991) or by more technically structured means and called neurolinguistic programming (Walter and Bayat 2003). In interpretative phenomenology, experiential learning in the form of ethical positioning or socially contextualised approaches to care is transferred when stories are shared by nurses. In neurolinguistic programming, medical students are encouraged to observe, store, recall and reflect behavioural signals which provide information on the personality of the patient thus enabling better treatment. The nominal difference appears to be merely cultural.

The experiential nature of the accumulation of intuitive knowledge means that one may be an intuitive expert in life rather than professional practice. It is interesting that in this respect Nelms and Lane (1999) found that many of the entrance students in nursing were already ‘connected knowers... looking for an arena to practice [sic] this capacity’. Such ‘knowers’ were able to apply a range of interpretative human life skills to caring practice, often in advance of any education in behavioural and social sciences. Such life competence is indicative of emotional intelligence. This is a self-instructive behavioural knowing which is sustained by perpetual subconscious integration and appropriation in the present, of wisdom gleaned in the past.

The third level is credence. **New credentials** The speed, sudden arousal and awareness of complex directive knowledge experienced by so many nurses in successive studies (Agan 1987, Benner and Tanner 1987, Rew 1990, Appleton 1994, Ling and Luker 2000) are more credible in scientific terms when reinforced by neuroscientific findings. The basis for the accuracy and predictive nature with which intuitive knowledge directs the practitioner toward remedial activity suddenly becomes clearer to us (Maloni et al 1986). In Maloni et al’s (1986) study the instinctive unease of neonatal nurses regarding the clinical presentation, physical appearance or state of alertness of certain neonates was endorsed by the lower scores registered by the same patients on the Brazelton Neonatal Behaviour Assessment Scale. It seems likely that such ‘hunches’ and ‘funny feelings’ were in fact concisely ‘packaged’ information messages delivered so swiftly and efficiently by specialised neural networks that practitioners could not explain ‘how they knew’ without in-depth guided reflection. This would explain the postulated ‘understanding without a rationale’ (Benner and Tanner 1987). In view of the neuroscientific evidence, it would seem that such a rationale is unrealised rather than absent. **Intuition and gender** While examining the relationship between credence and intuition, the relevance of gender both in terms of anatomical and physiological structural predisposition and social construction should be considered.

Agan (1987) is one of several researchers who speak of the derision which has greeted much intuitive awareness in nursing practice. This has often been ascribed to the fact that women possess greater intuitive ability than male medical staff to whom they may report their fears and concerns. Moir and Jessel (1994) presented evidence to support this view. In addition to some impressive social research, they showed that the more bulbous corpus callosum consistently found in women would suggest greater capacity for interplay between specialised centres in the right and left hemispheres of the brain. This purports a superior predisposition toward more accurate interpretation of human behaviour.
However, a review of the wider professional literature suggests that this may be an oversimplified explanation.

Intuitive practice is far from unique to nursing or peculiar to female-dominated professions. Intuition has been acknowledged as playing a part in medical practice (McKinlay et al 1996). Hayashi (2001) reported that not only is intuition used frequently in corporate business and commerce, design and manufacturing industries, but it also characterises potential senior executives as distinct from middle managers. These sources do not discriminate between men and women. Moreover, Hayashi’s (2001) article is conspicuously lacking in the self-doubt and contention which characterises similar discussion in nursing philosophy. Klein (2001) casts doubt on the reality of a barrier between ‘hard’ and ‘soft’ science by declaring that intuitive thinking is behind many of the decisions taken in rigorous controlled laboratory trials. Indeed, many scientists such as Thomas Edison followed ‘hunches’ (Carlson and Kaiser 1999).

Support for intuitive tools such as pattern recognition occasionally emanates from unexpected places. The late Nobel Prize winner Herbert Simon, a man heavily influenced in his life by logical positivism, described extensively the pattern recognition inherent in the thinking of chess masters (Gobet and Simon 1996, Fernandes and Simon 1999). The evidence which suggests a gender advantage in intuition cannot be easily dismissed. However, the wider historical picture of this mode of thinking at work in many other professions, some of which remain dominated by men, means that another perspective should at least be considered: that of the social and political power struggle between the sexes. The derision of intuition in nursing may have as much to do with patriarchy and the reluctance to permit epistemological development in a female-dominated profession as it does natural gender advantage (Code 1991).

Conclusion

The new generation of research shows the importance of paying heed to feelings when making clinical judgements, especially feelings associated with fear and apprehension. The arguments of many practitioners who favour hypothetico-deductive approaches over rational systems and decision trees are vindicated. In the cluttered, hurried, fluid world of healthcare practice, the host of variables affecting patient-centred planning is subject to change (Cowley 1995). When time is at a premium and

References


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probability calculations cannot always be made, the speed of information delivery inherent in affective frameworks provides a diagnostic edge (Almond 2001).

Despite the renewed insight into such approaches, intuitive practitioners are still left in want of a tool to facilitate decompartmentalisation and reduction of directives arising from such intelligence. They may struggle to articulate powerful yet nebulous feelings of unease which inform their practice. This situation has possible legal implications for nurses required by statute to record and justify the rationale for their actions (Nursing and Midwifery Council 2002). In the light of the role of feelings in empowering cognitive centres, a framework to guide and lend shape to intuitive judgement would be a powerful catalyst for reflection. Ideally the framework would facilitate identification of intuitive sourcing and articulation of metacognitive activity which can be documented. Harnessing intuition as a channel through which to mine the evidential basis for feelings to inform and support practice promises rich rewards for patient care and demonstrates expertise in a way that has proven difficult for nurses in the past. It is hoped that such an intuitive framework design together with evidence from a preliminary pilot measuring its success will be available in the near future NS

IMPLICATIONS FOR PRACTICE

A new generation of neural scientific exploration is informing practice and justifying intuition through use of neural imaging.

These findings make delineation and definition of intuition as a working concept easier.

Research in the field of emotional intelligence supports the findings of many nurse protagonists of intuitive approaches to care.

The current evidence base calls for a conceptual framework to harness intuitive thinking.