

The Physicality of Early-Stage Information Needs

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ABSTRACT

How do we realise that we need information: what motivates a movement from unconscious states of incomplete knowledge into conscious states of information need? Everyday language expresses this transition as motivated by sensory feelings of anxiety, dissatisfaction, or gut ‘feelings’ of something being wrong. However, there is no theoretical account of the sensory experiences that lead us to be aware of sub-conscious information needs. This short paper proposes that anomalous states of knowledge are potentially dangerous, and that our brains translate this potential harm into physical sensations which force our attention to the uncertainty caused by information incompleteness or inconsistency: that is, our brain encourages us to ‘feel’ information needs and that investigating how these often unpleasant feelings arise could be a fruitful line of enquiry into understanding information needs.

KEYWORDS

Information need; physical sensations; evolution; information behaviour; human body

INTRODUCTION

How do we know when we need information? Every day we encounter situations that result in the need to seek out information to tackle problems, satisfy desires, or simply resolve some uncertainty about the world. Sometimes this awareness of an information need is an epiphanic moment of insight; other times it is a gradual awareness of a situation that somehow feels ‘wrong’. Both situations result in a conscious need for information and the start of a process of obtaining that information. But how does an unconscious recognition of an inadequate state of knowledge become liminal, transformed into a conscious realisation of a need for information?

This is a classical problem for library and information science, one that has resisted investigation due to the difficulty of understanding pre-cognitive states. This paper proposes that the early stages of information need development are often characterised by uncomfortable sensations that stimulate a process of self-awareness to resolve this discomfort. It sketches the background to this proposal by examining the language used to describe information need, then places this within an evolutionary perspective, and finally considers some of the recent evidence from brain studies that may provide a link between how our brain handles dissonance, its consequent anxiety, and how we engage in information seeking.

EARLY-STAGE INFORMATION NEEDS AS PHYSICAL SENSATIONS

The evidence supporting the importance of sensation to information need development is scattered across research domains. In his classic 1968 paper, Taylor characterised the earliest stage of information need as the visceral level, an unexpressed need that may only manifest as a ‘*vague feeling of dissatisfaction*’ (Taylor, 1968) - note the emphasis on ‘*feeling*’. Kuhlthau noted that the uncertainty present in the early stages of information need development can cause negative sensations: ‘*uncertainty... causes discomfort and anxiety*’ (Kuhlthau, 1991) and one of her participants clearly differentiated between the cognitive feeling of uncertainty and the physical sensation of anxiety: ‘*[u]ncertainty is in the head but anxiety is in the pit of the stomach*’ (Kuhlthau, 1991). Nahl and Bilal talk about affective uncertainty as ‘*a feeling of unease due to the presence of cognitive uncertainty and it can be experienced as irritation, frustration, and anxiety*’ (Nahl & Bilal, 2007). Most recently, Ruthven (2019) showed that descriptions of earlier stage information needs contained a higher rate of sensory words compared to descriptions of later stage information needs, proposing that if we are struggling to understand our situation, and possibly whether we are in a problematic situation at all, then we may have to rely more on sensory signals as a source of understanding our situation. That is, in the early stages of information need, we must work more with what we can describe (our sensations and emotions) than what we cannot describe (the information that may be necessary to resolve our situation).

Others have also pointed to information seeking as being motivated by why something doesn’t feel right. Huttenen et al., (2020) for example describes this as a sense of friction: ‘*This **friction** between one’s own experience and how other people see the person had caused discomfort and need for information to understand this friction*’. These feelings of friction or discomfort speak to a physical sense of ‘wrongness’ that needs attention and can create ‘*a trigger for information seeking, finding the right words and understanding the experience*’ (Huttunen et al., 2020).

From psychology, Heintzelman and King (2014) argue that meaning-making is an instinctive human act: we all have a tendency to seek coherence in our everyday lives. They propose that a feeling that stimuli are not coherent drives us towards making meaning and feeling better. Park also describes dissonance as a *'highly uncomfortable state'* (Park, 2005). This feeling is maybe why some people seek meaning and others do not – only some people 'feel' a lack of meaning. Others have talked about physical sensations as motivating a conscious examination of the cause of these sensations. For example, in their model of exiting prostitution, Baker et al. talk about the earliest stages as involving both *"gut" feelings* and *'uneasy feelings'* which then *'reach a woman's conscious level'* where she can *'process them consciously thereby enabling her to verbalize what she had previously felt at the gut level'* (Baker et al., 2010).

For over 140 years we have known that there is a very complex relationship between various regions of the brain and the gut and that they communicate in sophisticated ways (Mayer, 2011). Others have also described senses as *'gut-feelings'* which indicate physical sensations that require attention. This is often studied in areas such as medicine to understand how complex medical decisions are made (Kristensen et al., 2022) and are often framed as intuition. King and Clark, for example, investigated the power of intuition stating that *'intuitive awareness ... appeared to act as a trigger, sparking an analytical process that involved the nurses in a conscious search to acquire data that would confirm their sense of change in the patient's status'*. This intuition was described as *'vague intuitive feelings of uneasiness or happiness about the patient's status'*, arguing that our physical gut-feeling can be the first step in understanding whether something is wrong and leading to seeking information (King & Clark, 2002). Stolper et al. agree, also pointing to gut-feelings being able to indicate when things are coherent and therefore providing a gut-sense of rightness (Stolper et al., 2009). Douw et al., from nursing, reported on similar sensations and summarises studies from the patients' perspectives who also often report uneasy feelings such as *'feelings of impending doom'* as a signal that something is not right (Douw et al., 2015), such feelings are being highly significant in diagnostic terms.

Therefore, there are lots of indicative evidence that physical sensations as manifestations of underlying cognition is important to our sense of needing information: that information is psychosomatic. The question is then why does this happen?

THE EVOLUTIONARY NEED TO RESOLVE ANXIETY

One perspective that may hold some answers is evolutionary theory. Most species are prey. To survive against predation, it is essential to be able to detect threats quickly and to decide how to deal with them. Bigger threats, and ones that are more uncertain, benefit from more attention and require us to be able to focus on the threat. Human species became primarily predators as opposed to prey relatively recently in evolutionary terms. Therefore, although a lot has been written about how we cognitively deal with threats (Baumeister et al., 2001) and we are, perhaps uniquely amongst animal species, able to reason about threats, our reactions to threats are still based on very primitive and engrained reactions to danger.

These reactions are largely centred around the limbic systems, very old parts of the brain in evolutionary terms and a specific part of the limbic system, the amygdala, may be of particular interest. The amygdala combines many sensory inputs, combines internal and external stimuli, and is highly connected to other regions of the brain. It plays strong roles, along with the thalamus, in providing quick assessments of danger. It is more likely to produce errors than the cortex, which is more accurate but slower, but false positives (labelling something a threat when it is not) is better than false negatives (missing a threat) and our cortex can kick and reason about the threat once the limbic regions have created an initial assessment.

The amygdala is also responsible for the conscious perception of emotion (Wright, 2020) and it seems to provide an emotional overlay to our experiences. This can then create powerful emotionally charged memories, helping us remember what is good and bad about our previous experiences. It also helps us detect information about others, so those with damaged amygdalae cannot read differences in facial expressions, and presumably therefore cannot question why those expressions have arisen (Wright, 2020).

The amygdala is strongly associated with both fear and anxiety and increased activity in the amygdala is associated with increased vigilance when faced with uncertainty (Grupe & Nitschke, 2013). It also produces the autonomic (involuntary nervous responses) components of emotion such as quickened heart rates, changes in blood pressure, and respiration which we correspond to the physical sensations of anxiety.

Anxiety and fear are not the same thing – fear is about known, immediate threats whereas anxiety is about unpredictable future events or outcomes (Grupe & Nitschke, 2013). As noted above, we already know that anxiety is a key motivating factor in seeking information. Anxiety and the need to resolve it by obtaining information has also been identified as problematic, e.g., in the case of cyberchondria in which a dysfunctional positive feedback loop occurs where information seeking increases worry, leading to increased information seeking (McMullan et al.,

2019). Information seeking, rather than soothing anxiety, leads to increases in anxiety due to failed anxiety reduction and then to excessive online searches, compulsive searching, greater distress and greater need to seek reassurance due to the information obtained from searching (Norr et al., 2015).

The amygdala is seen as the specific site of gut feelings so the physicality associated with early stages of information need may be an evolved response to force attention on confusion about the world and therefore potential threat that may arise from that confusion. Anxiety as a psychosomatic reaction to uncertainty then makes uncertainty physical and – if that physicality is perceived as discomforting – then we are more inclined to resolve that discomfort. One way to resolve confusion is to gain information about our proximate environment, to seek information to resolve confusion and remove the feeling of discomfort.

This is a proposition. Although we know a lot about how the brain works, and recent studies have started to give us neurophysiological accounts of information needs (Moshfeghi et al., 2016; Paisalnan et al., 2022), we still have a lot to learn about the relationship between our conceptual understandings of information needs and how our brains operate.

What I am proposing is that the sensory ways in which we talk about information needs is not just linguistic colour; there are physical feelings associated with inconsistent states of knowledge. Sometimes we move very quickly to knowing what information we lack and so may not consciously be aware of these feelings. Other times the movement is slower and the feelings more pronounced. Although I am emphasising potential danger and anxiety as a root cause, there are other possible explanations as well: there are claims that what the amygdala is reacting to is surprise, and there can be pleasurable reasons to want to know more – although these are often manifest physically as well. There is much to unpick here.

CONCLUSION

This aim of this paper is to open a way of linking our sensations of information need to the biology of what creates these sensations. The sensuality of the world, sensual forms of knowing (Howes & Classen, 2013) and the realm of sensory values ‘*the meanings and values placed on senses*’ (Kristensen et al., 2022) offers much to explain our everyday experiences of information and our lack of it.

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