

Making Meaning: a Focus for Information Interactions Research

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ABSTRACT

In this perspectives paper, I discuss meaning-making as an information seeking and interaction enterprise. I present meaning-making as a vital human reaction to significant life changes and present indicative evidence of how people go about gathering information for making meaning within their lives. I discuss some of the various forms of information that can be used for meaning-making, why it is an information seeking task that is different to those we are used to in information seeking research, and motivate meaning-making as a new focus for information seeking and information interactions research.

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1 INTRODUCTION

We typically motivate research into information seeking by the reasons for which information is sought. Often these are expressed as problem-solving reasons, e.g. [1, 2], in which information helps us complete a task or resolve some uncertainty about the world. Sometimes these reasons are work-based, e.g. [3], other times they are based on everyday concerns, e.g. [4], including our leisure and hobby activities, e.g. [5]. Reasons can also be based on thematic areas of life, e.g. tackling health concerns [6] or seeking refuge [7] or based on interactions with specific types of information [8]. Here, I discuss a new perspective based on seeking information that helps us make *meaning* in problematic areas of life: information that helps us make sense of our lives.

Sense-Making, arising from Brenda Dervin's substantive body of work [9], is a more widely used term than meaning-making

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within Information Science whereas other disciplines, such as museum studies, favour meaning-making as a term to cover both processes [10]. There is, however, value in differentiating the process of '*seeking comprehensibility*' of information (sense-making) from understanding its '*existential significance*' (meaning-making) [11]. That is, investigating the space beyond understanding information to exploring how people seek information to understand their own lives and how their lives may be lived differently. This may result in concrete decisions, e.g. to change a job or leave a marriage, or simply result in a new awareness of one's own life and its relationship to others'.

In this paper, I aim to show that there is distinct area of information activity about the most profound nature of our existences and to explore the challenges of this area for information seeking and interaction research. In section 2, I shall present background material to meaning-making. In section 3, I shall attempt to motivate meaning-making as an information seeking and interaction problem and, in section 4, I shall discuss what types of information supports the process of meaning-making. In section 5, I shall present some challenges for the information seeking and interaction research community to support meaning-making and conclude in section 6.

2 MEANING-MAKING

Searching for meaning is a common reaction to a significant life event. Some events seem to carry their own meaning – the birth of a child is often claimed to give 'meaning' to someone's life – or loss of meaning – bereavement often being accompanied by feelings that life has lost its meaning. Meaning-making literature focusses on the process of developing a new understanding of one's own life and a new sense of purpose for that life [12].

The literature also deals with wider groupings and how they create meaning from the information that they possess with McAdam, for example, arguing that meaning-making can occur at different levels: personal, community and national levels [13]. Chatman in her seminal studies of small worlds within prisons pointed to the meaning-making aspect of discourses regarding highly important topics, '*It is this system of common ideas about a shared experience that allows meaning to occur*' [14]. As will be explained in section 4.4, our ideas of the possible ways in which we might live our lives are constrained, to a degree, by the

information environments that provide the raw materials for our meaning-making activities. Meaning-making therefore has multiple aspects, including the perceived purpose of our lives and, at a wider level, an understanding of how things work within the cultures in which we live that life and which support our drive towards a life that is meaningful to us.

In the meaning-making literature from outside Information Science, there are two bodies of literature to explain meaning-making. One views meaning-making as a process that happens in *reaction* to an event such as redundancy or illness, section 2.1. The other sees meaning-making as occurring due to a gradual *awareness* that a current existence is not meaningful anymore and a new way of living may be required, section 2.2.

2.1 Significant events

In a review of meaning-making, Park focusses on the importance of meaning-making in response to difficult life events [15]. Her research distils into the following proposition: people possess '*global meaning*' systems that orientate them in the world and are used to make meaning about the world. Any dissonance caused by violations of this global meaning causes distress and sets in course a chain of meaning-making to restore balance and '*a sense of the world as meaningful and their own lives as worthwhile*' [15].

Global meaning systems are schemas, feelings, and perceptions about how the world operates combined with global goals relating to desired states around interactions with the world and a subjective sense of purpose in life that corresponds to the feeling that ones' life has meaning. These form the backdrop of how we interpret new events and situations, [15]. Some aspects of global meaning schemas are very strong. Wu et al., for example, investigate the 'General Belief in a Just World' (GBJW) – the belief that the world is generally a fair place and people tend to get the outcomes they deserve [16]. They demonstrate that this is a stable construct across cultures and a core human belief.

Of course it is not true and most of us realise it is not true whilst still holding onto it in order to feel there is some sense in our interactions with the world. A continuing belief in the GBJW, despite considerable personal difficulty, can be associated with better coping abilities, however an undeserved event such as significant illness can challenge such beliefs and a sense of perceived injustice can block positive adjustments to a life event.

Park's specific contribution is the proposal that new events cause us to appraise the discrepancy between the event and our sense of global meaning [15]. The degree to which an event violates our sense of meaning is directly related to the amount of distress we feel and this distress leads to the need for meaning-making. In Park's model, meaning-making is not problem-solving or emotional coping but an attempt to resolve a dissonance between what we believed about the world and the event that has occurred.

This may not only change our beliefs about the world but also our goals and perceived ability to reach these goals, leading to a loss of purpose and meaning. Park notes a large body of empirical

work showing that successful meaning-making can lead to better psychological adjustment and improved well-being [15].

Her approach might be criticised for its emphasis on negative life events that cause 'distress' as meaning-making may follow positive life events or simply confusion after a discovery that ones' life is not what we thought it to be. Genealogy and ancestry tourism, for example, often have strong elements of meaning-making by helping people contextualise their ancestor's lives and sense of where they come from [17]. Bruner's concept of '*turning-points*' in people's own life stories – the events in our lives that we use to distinguish what is important or significant about our lives compared to others' – also play an important role in our meaning-making about our own identities and our process of '*self-making*' [18]. However, Park's framework is useful in thinking about why people seek information during difficult life changes.

Heintzelman and King argue that meaning-making is an instinctive human act: we all have a tendency to make meaning and seek coherence in everyday life [19]. They propose an intuitive response to a lack of coherence corresponding to a 'feeling' that stimuli are not coherent which drives us towards making meaning and 'feeling' better. Park also describes this discrepancy as a '*highly uncomfortable state*' [20]. This 'feeling' is separate to our emotional responses, maybe explaining why only some people seek meaning, as they 'feel' the need to do so.

Meaning-making is not always successful and meaning may never be fully recovered. Neither does successful meaning-making necessarily make someone better off than someone who does not attempt meaning-making. However the literature generally agrees with [21] that '*more coherent narratives were related to more effective problem solving, communication, affective responsiveness, and overall general family functioning*' arguing that the outcomes from successful meaning-making (a greater sense of coherence and purpose in one's life) is better than its absence.

2.2 Gradual awakenings

Other life changes that lead to meaning-making are not the result of significant events such as illness but rather from reorientations of our lives. These reorientations result from a growing awareness that our lives are not working, leading to the desire to belong to a new community or social grouping that is a better fit to how we wish to live our lives in a more 'meaningful' way.

Straus [22] proposed a three-stage model to outline how such change can occur, using the term 'seeker', more or less synonymously with 'information seeker'. Straus's model focussed on religious conversion but the findings generalise to life changes.

In his model, the seeker starts by going through social networks, chance encounters and any available sources of information for leads to possible sources of help. Like most authors, Straus posits that religious conversion starts with a significant life event, such as bereavement, that encourages thoughts on whether a new way of life might be a better fit. Information seekers here are looking for progressive definitions as the basis for understanding (what does it mean to be gay/Muslim/divorced/etc.) and display few

concrete strategies in order to find information; rather they act by ‘groping through opportunities as they turn up’. Information seekers may not see themselves as active seekers but rather as people who are receptive to information on a particular theme.

As seekers gradually become aware of their own needs, based on interactions with people and literature, they become increasingly strategic in their information seeking, focussing on good sources of information and interactions with formal groups. Here, there is often a process of learning social norms and practices for conversion and belonging. Although many religious texts emphasise single moments of enlightenment and put forward role models such as St Paul who exemplify sudden moments of divine change, for most people this stage is experimental in nature, testing out belonging with new communities and new ways of living.

Finally, seekers move into a deeper maintenance phase of belonging, understanding practices and reflecting on the experience of a new lived identity. Rules and practice of religion are important to construct a framework for this new identity and we see active information use in the form of reading scripture, for example, to ensure that the new mode of living is ‘*experientially real*’ [22]. Reinforcement and support is a key need in this phase with [23] pointing to re-finding known religious information being a key activity many religious people .

Each stage involves information seeking from initial tentative information encountering to more formalised information interactions. This pattern of moving from initial receptivity to information moves into an active seeking phase and then to a state with a high level of domain knowledge about information sources and practices is also found in other areas of life such as coming-out as LGBT [24, 25] and joining new social groupings [26].

This model is in contrast with a more traditional passive model of identity change that presents individuals as ‘being’ converted or ‘being’ radicalised into new identities; rather individuals actively seek meaning by interacting with others who represent a ‘*collectivity*’ [22] and who are prime agents in their own change.

3 MEANING-MAKING AS AN INFORMATION PROBLEM

Meaning does not happen easily; usually it must be sought and constructed. We can find evidence for information seeking and information interactions to support meaning-making where people ask for information, hold discussions about important topics or talk about their lives and their search for understandings. In this section, I provide indicative evidence of Internet tools being used by those in the process of making-meaning about their lives.

3.1 Search Engine Logs

Internet search engines are now a common way of finding information. Meaning is not something we can ask for directly. However, we can see people trying to orientate their lives in different direction and asking for information to do that. A glimpse at the AOL search logs [27] show people trying to gain information to (1) move their lives into better places, e.g. *how do you get over mourning a loss one, how to get over losing my boyfriend, how to get over a broken heart, how does one get over grief, how to deal with death, how to deal with schizophrenia*, (2) understand challenging life situations, e.g. *childless not by choice, am I depressed, how will I know I am starting perimenopause*, or (3) understand what it might take to change a life, e.g. *steps to transition from male to female, steps to getting a divorce, 7 steps to stop addictive behaviour*. Finding information on these topics is easy, but as will be discussed in section 5, finding the right information is not simple.

3.2 Internet Forums

We can find evidence for information seeking and information interactions to support meaning-making in online forums as well. These interactive spaces have the advantage that other people can contribute to understanding a situation and contributing ideas or experiences to help a person make sense of their life. Online groupings can create common understandings of a condition or situation that help people orientate themselves and provide a vocabulary for their own experiences, section 4.3.2.

On social Q&A sites we can see people asking questions such as ‘*Was I really molested or was it my fault*’¹, ‘*I think I want to start by knowing whether or not it was rape*’² or ‘*am I depressed or just pregnant*’³ where they are seeking definitional information about their lives to start the sense-making process that leads to meaning-making. These definitions help orientate people, provide a basis for thinking about their lives and how they should act to change their lives. We also see people asking questions about how to change an unsatisfactory existence such as ‘*how do I become a better person*’⁴, or ‘*how can I behave better*’⁵. These are not simple questions and often mark the start of a process of change.

3.3 Epistolary Forms

Meaning-making can be an active process that goes beyond accessing information to creating information as a way of understanding one’s situation. Self-expression can be a process of bringing something deep and personal out into the open for examination. Alternatively, as the old joke has it, ‘*I don’t know what I think until I hear it come out of my mouth*’⁶. One person’s account of their meaning-making journey can be useful to others who are at earlier stages of their meaning-making process.

¹ <https://answers.yahoo.com/question>

² <https://www.thestudentroom.co.uk>

³ <https://www.mumsnet.com>

⁴ <https://uk.answers.yahoo.com/question/index?qid=20170615100410AA2ONvh&guc>

⁵ <https://uk.answers.yahoo.com/question/index?qid=20130423095722AALIMX8>

⁶ More formally, this can be viewed as Discovery Writing. See, for example, <https://ore.exeter.ac.uk/repository/handle/10871/13802>.

Sites such as <https://blog.feedspot.com> host hundreds of blogs on topics such as widowhood, pregnancy, divorce, and other significant life areas. Some of these blogs are pure self-expression providing accounts of personal journeys, some are interactive providing a focus for discussions and shared experiences and some are in the 'agony aunt' advice columnist mode where people can interact with an 'expert' on a topic. Expert here often means someone who has experience of the topic rather than professional training or expertise. For those undergoing a significant life change, though, experiential information is often highly valued.

We can also see meaning-making through self-expression occur in narrative forms such as diaries or archives. Archives such as the UK Mass Observation archive⁷, a record of everyday life in the UK between 1937 and 1955 or the US National Archives⁸, are rich sources for examination how people use the act of writing as a means of self-understanding. Oral histories can also form a useful source of information on how individuals have made meaning.

Such self-expression can even rise to the status of art. Oscar Wilde's *De Profundis*, for example, talks about his process of working through disgrace and imprisonment to a psychological state where he can recreate his life: '*the ultimate discovery at which I have arrived, the starting-point for a fresh development. It has come to me right out of myself, so I know that it has come at the proper time ... My nature is seeking a fresh mode of self-realisation*'. In such cases, we see how *active* is the process of meaning-making involving strong cognitive and emotional work.

4 WHAT SUPPORTS MEANING-MAKING?

People who engage in meaning-making are setting out on a psychological discovery process without a clear idea of where they may end up. The result of meaning-making may differ markedly for different people but information in various forms is usually critical for this process. In this section, I discuss some core types of information that the literature has identified as being useful in the meaning-making process. The major theme in this article is an individual's search for meaning, and meaning-making is a personal journey, however the meaning that can be made is typically shaped by our social settings and what meanings have already been made by those around us.

4.1 Factual Information

Meaning-making often occurs in response to a new life event and new events typically require new information. Some of this information will be information on how to define the event; to help us appraise the event and decide how (and if) to act [28]. As Russell et al. note, even a diagnosis of a serious illness can be positive in that it may clear up severe uncertainty and rule out alternative, worse diagnoses [29].

Sometimes, meaning-making takes the form of meaning-focussed coping: an appraisal-based coping process in which people draw on their beliefs, values or goals to maintain their well-being

during and strengthen their coping abilities during stressful life events [30, 31]. Park suggests that meaning-making can involve the search for a more favourable interpretation of current events [32] and therefore a more positive interpretation of the future. However, the key tasks in most accounts of coping are to understand what it is we are facing and how, then, can we deal with it. The 'what it is we are facing' is close to sense-making - making sense of a new situation - whilst the 'how can we deal with it' moves into meaning-making as the 'dealing' involves decisions about how we live our lives and how we respond to the new situation. Both these stages require information.

Some events can, such as bereavement, can be a time of personal information seeking (from the person we are about to lose) or, following a death, leads to a process of information seeking to understand previous generations better and make meaning about our family history. This can be a time where we uncover new information that forces questions about our immediate family history. Stalfa introduced the theoretical concept of '*posthumous disillusionment*' or what he refers to as '*an identity crisis in the midst of grief*' sparked by revelations about the deceased [33]. This can be especially pertinent to suicide, leading to the presence of unanswerable questions (why did I not realise there was a problem?). These unanswered questions may lead therefore to information seeking to restore some kind of balance in understanding who we have lost. Bogensperger and Lueger-Schuster's examination of meaning-making after a bereavement show that information seeking on the death itself may be important [34] to lay the basis for how we make meaning about the event. Was a death an unfortunate accident or Act of God? Different answers can lead to different kinds of meaning e.g. are we a victim of some random event or part of some greater plan?

A particular focus when considering factual information during meaning-making is on what is 'normal' [35] and many authors talk about '*shifting normalities*' [36] during significant life changes including trying to predict what new lives will be like, both '*Heading toward the new normal*' [37] and '*constructing a new conception of self*' [38]. The search for normality requires searching for information to develop an interpretive repertoire about one's life: to be able to tell what about a new situation (one that may or may not feel 'normal') requires attention and concern. Brashers et al. [39], for example, observed how people with chronic illness, over time, can develop strong abilities to 'read' their own bodies and detect the significance of physical signs which may or may not indicate a health concern.

4.2 Spiritual Information

As noted in section 2.1, meaning-making can be necessary because our sense of global meaning has been disrupted and this sense of global meaning is often a religious framework for understanding our lives [20]. People with religious perspectives cope better over longer periods and adapt better to negative life changes even if they may encounter more distress in the initial period after a

⁷ <http://www.thekeep.info/collections/mass-observation-archive/>

⁸ <https://www.archives.gov/>

negative event, [20, 40]. The conclusion being that religious belief may make an initial trauma worse but spiritual belief can act as a coping mechanism for longer-term recovery.

One starting place for the process of religious change is recovery from trauma and there is a large body of literature on this topic. Decker argues that traumatic change necessitates some change in life and the sense of self can lead to seeking higher level meaning and even in the most extreme traumas people can seek positive life changes as result [40]. Conversely, trauma can cause religious disillusionment. The dark night of the soul – a period of religious estrangement, a condition that causes much distress to religious people - is often caused by some traumatic event [41].

Religious information seeking during conversion to a religious life or conversion from one religion to another involves learning new facts, such as on the practices of a new faith group, but also information seeking as a process of understanding a new way of living and there is a heavy emphasis in the literature on personal narratives. Narratives are heavily used by information providers as well as information seekers. Religious literature, in the form of parables, prayers, stories of admirable lives, etc. offers ways of examining one's own life in comparison with others through stories and experiences in a similar way to how modern-day biographies offer comparisons. Highly significant figures such as patron saints who 'understand' our situation are commonly sought out in times of distress. Hess notes that people can often find comfort in religious ritual as '*Rituals provide structure and reliability that counters the chaos and randomness of trauma*' [42].

4.3 Other people

During a period of meaning-making, other people are vitally useful: from being initial sources of information to becoming guides in how to live with a new identity within a new community. Often during these times, we seek 'wise' people: people who have extensive experience and insight into a particular area of life and who can guide us in unfamiliar territory. These come in two forms: professionals whose role is to provide support in life changes and volunteer community members who provide support, often without training or accountability.

4.3.1 Professionals

Within the professional literature of numerous disciplines, there are many discourses around meaning-making, even if not all use that phrase. For example, Transitions Theory, coming from nursing practice, focuses on the role of professionals in supporting successful transitions from one stage in life to another [43]. Many transitions are expressed as entering a state (becoming a widow/cancer patient/mother) but the exit from states can also be important (leaving a marriage, recovering from treatment, retiring) and the ending of roles is often the first stage in taking on new roles. The starting and ending of life roles can be challenging or liberating depending on the types of roles being left and the nature of that leaving.

Transitions Theory uses roles to shape the idea of a successful mastery of that role. The concept of role insufficiency is important: sometimes we cannot act a role successfully and this

manifests in negative symptoms such as depression or anxiety or as a sense of powerlessness. One of the core contributions of Transitions Theory is the idea of role supplementation, the professional responsibility of nurses to identify where people are failing to take on new roles successfully and support them in this. Formally, role supplementation is '*further defined as the conveying of information or experience necessary to bring the role incumbent and significant others to full awareness of the anticipated behaviour patterns, units, sentiments, sensations and goals involved in each role*' [44]. This emphasizes that role comprehension, understanding a new life role, can be planned for and that nurses can support role changes.

Lloyd's notion of transition from novice to expert with the '*ability to access information through the lived experiences of practice*' and the '*cognitive scaffolding*' she describes by which experts support literacies of novices within new roles is an important part of meaning-making [45]. Professionals provide information, ways to learn about what to expect from a new life change and how others can deal with changes. Both Transitions Theory and Lloyd emphasize the experiential nature of this information; not just passing on facts but helping people learn from other's experience.

4.3.2 Community

Some transitions are supported by professionals; in other life transitions, there is no professional support and therefore any support is informally arranged through non-governmental agencies, churches, charities or community members. Here, communities often provide their own intermediaries and mentors, who can be positive and supportive or negative and manipulative.

Yeh [24], for example, examining the identify formation of gay men and lesbians in Taiwan, emphasised the role of mentoring as an important, but not universal, stage in connecting with homosexual communities. One critical role of mentors is in explaining social norms of those communities in order to be accepted and, therefore, become able to access information. Kubiak et al. [25] also mention the valuable role that non-sexual mentors can play in the initial stages of coming out.

Harviainen looked at information practices within the BDSM community [26] and the importance of mentors, not a term Harviainen uses but which fits the role, in joining a new community. Importantly, he noted that the initial phase of joining a new community, and the relief from stigma that can be associated with this stage, can lower an individual's information literacies leading to an over-belief in the information provided. Once an individual is established within a community, they can then develop more critical approaches to information.

Transitions that are viewed negatively by one's social network can lead to people being more vulnerable when transitioning to a new life and mentors can have a very dark side: Knowles for example [46] showing that rape and sexual assaults in prison are often highly planned and based on grooming techniques from those posing as mentors. Those who are more familiar with prison environments or who have social groupings that they can access can become aware of such techniques; those without such

informational support are more likely to end up as victims. Kubiek et al. [25] is one of the few papers to mention the role of sexual partners as a source of information on social norms, pointing out the often manipulative nature of such information.

Seeking out those who can aid us in understanding a life change, though, is a natural response. Buunk and Gibbons, reviewing the literature on Social Comparison Theory, suggest that fear-based life changes lead to seeking those in similar situations as do life changes that have a great deal of uncertainty, such as disability [47]. This accords with theory of Davison et al. and their claim that affiliative behaviours – looking for people who are similar – often increases during times of anxiety as we look for people who are similar for understanding and to judge normality and that the shared experiences of others can be more important than professional information structures. The support gained from others' experiences are part of the reason that support groups for things like diet and smoking cessation are common [48].

In health situations, social groupings also help '*paint a portrait of diagnosis*' by developing a collective understanding of disease. Conditions that are socially stigmatising, embarrassing or disfiguring can lead to alienation from normal social support groups [48] and therefore moving outside of our normal social circles to aid understanding and meaning-making. Similarly, the social support systems we normally rely on may not have experience of certain life events and therefore need to seek out others to help with meaning-making. In such events, we are more likely to seek those who have been in similar situations rather than those about to face them. i.e. want information and to reduce stress rather than share it [47].

4.4 Narratives

People can be of direct use for advice, information or support during times of change. People can also be of indirect help by providing narratives that can inspire or demonstrate new ways of living a life and examining how other people have lived their lives can be a way of understanding how we can live ours. Adams and Pierce, Trevor and Boddy, and Taylor all discuss the role that literature, in particular autobiographical and fiction, play as a means of understanding a life change [49-51]. These narrative forms help us understand the possibilities for our life, as Singer notes '*The stories that individuals create [of their own identity] draw from the existing repertoire of cultural narratives based in myth, fable, literature, popular entertainment and ethnic family history that define the meaning making parameters of their lives*'. We create and tell stories about ourselves to express the meaning we have made about our lives [52] and we use existing literature to help us create these stories. Some works are particularly powerful, as noted by Ferrari et al. '*Some works of literary fiction and historical narratives become canonical for the exact reason that they model or portray a generally accepted ideology that is abstracted into a master narrative. Cultural master narratives are sense-making structures available to individuals, effectively guiding and shaping the stories they tell to others and themselves*'. [53].

In the case of marginalized groups, literature and mass media may be the only way for people to access representations of their own lives. Visual representation of same-sex attraction, which may often be missing in everyday life, was previously only to be found on mass media and formed an important method of passive information seeking about life's possibilities [54].

Mass media can also provide factual information that forms part of a background knowledge about life. Rothbauer [55], Pecoskie [56] and Liming [57] all point to literature forming an important source of support for identity formation and communication of sexual identities, with literature being especially used during early stages of understanding one's own sexual identities. They also show that fiction often to be read between the lines or 'against' the text to uncover possibly hidden meanings that can be 'read' by a gay/lesbian reading perspective. In Liming's study she uncovered many subtleties in reading patterns to search for lesbian narratives within 'heterosexual' texts and changes in reading habits to 'protect' these interpretations.

Not everyone reads fiction of course and these studies often point to the need by participants to hide such literature to allow safe exploration. However, the power of literature cannot be understated and is reflected in the strong attachment of readers to fiction that was important to their understanding of their identity. Even in literature some groups are under-represented, with Waite, and Adams and Peirce [49, 58] noting that portrayals of transgendered characters are not always positive and, compared to LGB characters, appear far less often and less centrally.

Discussion forums are a place where anyone can provide a narrative of their own life and can be seen as a form of what Veinot refers to as collaborative information behaviour with communities sharing their own experience and personal knowledge, [59]. Straus states that '*[the] collective organisation and employment of ritual and other institutions has some direct, practical value in participants' endeavours to create and maintain orderliness and meaningfulness in their lives*.' [22]. That is, communities can create structure and meaning that lead individuals to feeling that they have some coherence to their own existence. This links strongly to the underlying principles of Everyday Life Information Seeking and its concept of mastery of life in which we feel some control over own existence [4].

A core theme in meaning-making is the need to develop understandings of a new situations, such as widowhood, recovery from addiction or parenthood, and what they mean in the sense of what are their characteristics, potentials and limits. These are not quick fix tasks that can be answered during a single search engine session, rather they often seem to be a longer-term, almost meditative process of uncovering a new existence.

A common source of inspiration for this are self-help books and material. Self-help has as its core this aim of understanding life events through sharing lived experiences and talking through significant life events. As a genre, self-help ranges widely in quality and tone but many contained distilled, popularized scientific understandings of an area of life that can help explain a

situation a person has entered or give them a way of understanding how they came to a particular point in their own life. The use of narratives, also common to recovery from addiction [60], is common to people trying to find a new way of living rather than incorporating a change into an existing life.

5. INFORMATION INTERACTIONS

As noted in Section 1, the reasons we engage in an information search are often based on problem-solving or task-based understandings. The task of meaning-making is to reconstruct a sense of identity and purpose within our lives. Such understandings are not problems in the sense that information retrieval typically understands; they may come from problematic situations that can, but do not always, benefit from information. However, meaning-making is very subjective: what works for one person may not work for another. It is also an area in which filling cognitive gaps alone is not sufficient; information has to speak to the whole person, including their desires, beliefs, and motivations. Sometimes the right information may be a patchwork of sources or it may be a single object that provides a flash of particular insight. However, we can start to map out how information interaction and retrieval can approach meaning-making as a concept. I will present the discussion under two headings: what interactive techniques may support meaning-making and how do we evaluate support for meaning-making processes?

5.1 Interactive support

Meaning-making may require different kinds of interactive system support, each of which can present new challenges for information interactions research. Some options include:

- **Recommendations.** Many sources of information are associated with user-generated content in the form of recommendations, reviews, and personal experiences. These can help an individual make decisions about what information to use, what books to buy or what sources of support to seek. They can be used to create reading lists and support repositories. Not all sources are equally useful and some may be more useful than others. As noted above, in some areas of life there are canons of books, including biography and fiction, which communities use as sources of particular inspiration and understanding. The question is then how to detect from this content which information is useful for the particular purpose of meaning-making as opposed to other uses: what films, books, essays, etc. change lives as opposed to simply being enjoyable or interesting?
- **Articulating sources of support.** As noted in section 4.3, people can offer useful support during a life change, explaining new experiences and offering support. Those in the early stages of experiencing a problematic information are often unable to express precisely what they want and benefit from interactions with sympathetic and knowledgeable peers [61, 62]. Expertise finding is an established information retrieval task but less common is recommending *groups* of people, either in the form of official support services or also forums and discussion groups. How to identify the best sources for meaning-making is not clear.

Issues such as topical expertise are naturally important but people who are sought out for support during meaning-making need to have credibility so issues of trust, empathy and accessibility become important. How can we operationalise such attributes in order to recommend groups to people in search of support?

- **Structuring support.** As described above, whether meaning-making occurs in response to an external life event or an awareness that a life needs change, there are distinct phases of adaptation. We are used in interactive information seeking and retrieval to thinking about phases, e.g. in Kuhlthau's information search process or Taylor's four levels of information need [63, 64] but it is far less common in interactive research to see support for different phases. There are also indications from the meaning-making literature that the right information presented at the wrong time will not be recognised as useful. Therefore, considering what information is most appropriate for different stages of meaning-making is crucial. Early stage support could focus on sense-making information, later stages on coping and adaptation information for example. Meaning-making literature shows that people use different information seeking strategies at different phases of a meaning-making journey, e.g. [22], but we lack detail on how systems could provide different information, or provide information in different ways, for people at each stage.
- **Narratives and possibilities.** As outlined in section 4.4 narratives are very useful in thinking about new possibilities for our lives after a change in our circumstances. Sometimes these narratives may involve leading very different lives with different purposes. A novel search task may then be how to retrieve narratives: how to retrieve fictional or factual accounts of lives that may provide inspiration for how to live our lives?

5.2 How to evaluate meaning-making?

Meaning-making is often stimulated by a range of sources including discussions, narratives, and dedicated resources. Sometimes meaning-making can occur rapidly and without (much) new information but, as indicated in section 2, it is most commonly a process of adjustment, one of change minimization to retain as much as possible of our current beliefs and ways of living, then adjustment to a new mode of living and understanding. This adjustment may be preceded by a phase of negative emotions such as depression, uncertainty, confusion, arising from the need for change and uncertainty about how to change. Meaning-making often happens after this, as a process of exploration, testing, and learning being played out.

The information required for meaning-making is unlikely to be obtained through a single search session. Neither can we evaluate it as a collection of topically relevant information. That is not to say that we cannot judge some information as being more useful than others for meaning-making, a point I shall return to later.

The meaning that is made through meaning-making can vary drastically between people after the same life event and so we cannot prescribe what meaning is and evaluate it against a known ideal outcome. However, we can investigate the *process* of meaning-making and how information has contributed to this

process. One source of inspiration is Transitions Theory, section 4.3.1, a theory arising from nursing that has a strong emphasis on life roles and how we enter and exit life roles [65]. Transitions Theory has been used across a range of life transitions including changes in job roles [66], personal changes such as menopause [67], becoming a care-giver [68], and illness diagnoses [69].

Transitions theory uses the idea of roles to shape the idea of a successful mastery of a life role. This speaks to Savoilainen's concept of '*mastery of life*', or '*one's pervasive and relatively enduring feeling of confidence that the stimuli deriving from internal and external environments are structured, predictable, and explicable; that one has adequate resources to meet the demands posed by these stimuli, and that these demands are meaningful and worthy of engagement.*' [4]. Savoilainen defines mastery of life as aiming at '*[the] at elimination of continual dissonance between perceptions of "how things are at this moment" and "how they should be."*' This is similar to how we characterized meaning-making: a process of regaining mastery of our own existence, necessary due to a perceived discrepancy between our world as it was and how the world is now.

The concept of role insufficiency is important: sometimes we cannot act a role successfully and this manifests in negative symptoms such as depression or anxiety. One of the core contributions of Transitions Theory is the idea of role supplementation, the professional responsibility of nurses to identify where people are failing to take on new roles successfully and support them in this. Formally, role supplementation is '*the conveying of information or experience necessary to bring the role incumbent and significant others to full awareness of the anticipated behaviour patterns, units, sentiments, sensations and goals involved in each role*' [44]. Ultimately it is this sense of control and that '*demands are meaningful and worthy of engagement*' [4] are what meaning-making is heading for and how it should be evaluated.

In terms of meaning-making we can think of measuring the degree to which a person has identified useful sources, developed an understanding of their new life and its potentials and feels happy with new life changes. We can also try to measure the degree to which they have obtained information to help this support. This is not trivial- and may require new evaluation approaches - but it is how the practice of information provision in operational environments such as hospitals or care centres is typically performed and colleagues in these services may have useful ideas on how to evaluate our solutions.

Sense-making and meaning-making are related. This paper has taken the view that sense-making leads into meaning-making and what sense has been made directs what meaning can be made: knowing the likelihood of cancer returning or how a traumatic situation could have been avoided does make differences in terms of the meanings that can be made from these situations. This does not imply a strictly linear relationship; rather, more likely, with life changes there are iterative episodes of sense-making, meaning-making and information use. Creating a more nuanced way of separating and relating sense-making and meaning-making can also help with creating new evaluation approaches.

At the document or object level we may also think about what relevance means in terms of meaning-making. Saracevic defined motivational relevance as the highest level of relevance and that '*Satisfaction, success, accomplishment, and the like are criteria for inferring motivational relevance*' [70]. These criteria go beyond simply solving problems, rather they suggest that information at the highest level of relevance, information needs to speak to a whole person and their feelings about what they have achieved. In meaning-making there is a similar perspective, that the information has to resonate with a person and speak to a deeper need for transformational change. In a sense, this is what is critical for meaning-making, to find information that religious writers often call '*revelatory knowledge*', information that goes beyond simply providing factual information but promotes a deeper sense of understanding. Can such information be automatically detected? This seems a major challenge for information retrieval.

6. CONCLUSIONS

The literature on meaning-making generally follows the line offered by McAdams, '*that making personal meaning out of life stories typically involves drawing semantic conclusions out of episodic events*' [13]. That is, we use events that happen to us to create a sense of meaning and purpose for our lives. Sometimes these events are unexpected: settled lives may become unsettled or require reconfiguring, resulting in information needs about many areas of life that were previously unproblematic.

Meaning-making does not occur instantaneously and Horowitz has suggested that information avoidance behaviours could be sign that individuals are trying to incorporate information about events that is incompatible with previously held beliefs [71]. Where information professionals can be of use is in appropriate interventions. For Kuhlthau, meaning is the motive for information interactions and she called for collaborative work between information professionals and lay people on how to create meaning, stressing the important role of helping people make meaning out of events and information [63].

Other authors have shown that appropriate intervention can be useful to avoid negative conditions, such as depression, resulting from poor adjustments to life changes. Another useful role of information intermediaries, including systems, can be to help recover identity [72]. The end results of meaning-making can be concrete and measurable, e.g. in terms of having a concrete vocabulary to talk through experiences and feelings [73].

Information science has not dealt as fully with meaning-making compared to sense-making although it is a rich area for study. This perspectives paper proposes meaning-making as a new focus for information-centred research. It is a challenging area as meaning can be difficult to capture and robustly investigate. However, meaning-making is one of the most psychologically important tasks of being human and an area where information interactions research could make significant and profound changes to how we live our lives.

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