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FAITH INFORMATICS: SUPPORTING DEVELOPMENT OF SYSTEMS OF MEANING-MAKING WITH TECHNOLOGY

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In seeking to apply HCI to faith, religion, and spirituality, we turn to existing work in theology and psychology—in particular, work that studies the development of faith in individuals and communities. James Fowler is a pioneer in faith development, having developed a stage-based model after conducting over 300 interviews with individuals from a variety of religions [1]. In his work, Fowler suggests that faith is universal to all humans, and he provides an understanding of faith that we believe would serve the HCI community in grounding further efforts to integrate HCI practice with spirituality, faith, and religion.

Fowler describes how most religious organizations fall short in supporting the development of faith in their constituents, as they fall prey to a *modal developmental level*—the most commonly occurring level (the mode) of development for adults in a given community (empirically, stage 3 of 6, explained in depth below). In other words, the developmental level that is most common in the adults of a community shapes the culture and normative goals of individuals growing up in that community, which Fowler calls an "effective limit on the ongoing process of growth in faith" [1].

HCI researchers are good at understanding how individuals form and act upon mental models. That is one of our aims when we try to develop technology: to understand people and what might help them. In helping individuals with their systems of meaning-making (faith), we might want to do something very similar. This, we suggest, is one of the prime challenges and opportunities for HCI researchers when engaging with faith and spirituality: to seek to understand and support individuals through their *faith-ing*. Here, we outline future research directions for what we are calling *faith informatics*: the study of systems that facilitate growth in individuals' systems of meaning-making.

One direction for faith informatics could involve structured reflection, visualization of the self, and social connection. One goal might be to reify the existence of all stages of faith, beyond the normative, modal developmental levels present in many faith-based communities. By developing systems that support faith development regardless of religious (or nonreligious) orientation, computing and HCI hold the promise of supporting faith development and maintenance, highlighting convergence across religious traditions and supporting universal mature faith.

Faith as fundamental to the human experience

The word *faith* is often associated only with "belief," in that having faith is just a matter of what one believes to be true. Wilfred Cantwell Smith suggests an alternative: that faith is not dependent on belief [2]. In this vein, faith is neither tentative nor provisional, while belief is both.

Fowler draws on this and suggests an alternative conceptualization that views faith and religion as separate, but reciprocal [1]. Fowler views religion as tradition that is "selectively renewed," as it is "evoking and shaping" the faith of new generations. Faith is an aspect of the individual, while religion represents the tradition of the culture in which the individual grows and develops. Faith is an aspect of every human life, an "orientation of the total person," and, as a verb, an "active mode of being and committing." Faith is considered to be "the finding of and being found by meaning" [3]. This focus and widening of faith to include the association with meaning-making is not only inclusive of many religious and spiritual traditions, but is also vital in nonreligious traditions such Alcoholics Anonymous's 12-Step Program. For HCI, this conceptualization resonates with existing research developments devoted to understanding the role of computing in finding and supporting meaning-making [4].

Specifically, Fowler describes three *contents of faith* that every human subconsciously holds in mind as they go about their life: 1) *centers of value*, which are whatever we see as having the greatest meaning in our lives, 2) *images of power*, which are the processes and institutions that sustain individuals throughout life, and 3) *master stories*, narratives we believe and live that facilitate our interpretation of the lived experience [1].

If faith is a universal human condition, as suggested by Fowler and Smith, then HCI researchers have much more purchase to engage with research questions related to faith, as that work would therefore have the potential to be applied to all of humanity.

Stages of faith development

Fowler describes a series of six stages of faith that are loosely aligned with age during the beginning of life, but development can be arrested in any stage [1]. Similar to Robert Kegan's forms of mind [5], each progressive stage of faith is represented by a changing relationship between subject and object as an individual starts to consider a larger system as part of the "self" with regard to meaning-making. An overview of each stage suggests a diversity of use-cases for faith informatics.

Stage 1: Intuitive-projective faith. According to Fowler's interviews, intuitive-projective faith is found in 7.8 percent of the population and is the dominant form found in children ages three to seven. Intuitive-projective faith is marked by fluid thoughts and fantasy, and is the first stage of self-awareness. Fowler explains that transitioning out of stage one involves the acquisition of concrete operational thinking and an ability to distinguish fantasy from reality.

Stage 2: *Mythic-literal faith. Mythic-literal* faith is estimated to be found in 11.7 percent of the population, and largely in children ages seven to 12. Mythic-literal faith involves the individual starting to internalize the "stories, beliefs, observances that symbolize belonging to his or her community." Individuals in this stage create literal representations of centers of power, which often involves anthropomorphizing cosmic actors. Individuals in this stage may take religious texts literally as a foundation for meaning-making. While Fowler's work did find a handful of adults in stage 2, many would transition out of this stage in their teenage years, as they experienced multiple stories that clashed and required reflection to integrate.

Stage 3: Synthetic-conventional faith. Synthetic-conventional faith is the most commonly found stage of faith in Fowler's sample, and appears in 40.4 percent of the population. Transitioning into this stage often occurs around puberty, and is associated with a growing connection to social groups other than the family, perhaps with different collective narratives and centers of value. Synthetic-conventional faith systems attempt to "provide a coherent orientation in the midst of that more complex and diverse range of involvements...synthesize values and information...[and] provide a basis for identity and outlook."

This stage is highly aligned with Kegan's view of the self-socialized mind [5]; both are intended to deal with meaning-making involving multiple social relations and belonging to various social groups. In this stage, individuals create their personal myth: "the myth of one's own becoming in identity and faith, incorporating one's past and anticipated future in an image of the ultimate environment." Transitioning to the next stage often involves a breakdown in the coherence of the meaning-making system, such as a clash with religious or social authority or moving to a new environment (i.e., leaving home).

Stage 4: Individuative-reflective faith. Developing an individuative-reflective faith system (32.9 percent of the population) requires an "interruption of reliance on external sources of authority." Individuals in this stage are characterized by separation from previously assumed value systems, and the "emergence of an executive ego." Fowler notes that some individuals may separate from previous value systems, but still rely on some form of authority for meaning-making, which can arrest faith development in the transition to individuative-reflective faith. This stage involves taking responsibility for one's "own commitments, lifestyle, beliefs, and attitudes" and would be aligned with Kegan's "self-authoring" form of mind.

Stage 5: Conjunctive faith. Stage five, according to Fowler, is difficult to describe simply. Conjunctive faith was found in only 7 percent of the population, and not until mid-life (ages 30 to 40). Conjunctive faith involves a deeper acceptance of the self, and integrating "suppressed or unrecognized" aspects into the self, a kind of "reclaiming and reworking of one's past." This stage is similar to Kegan's self-transforming mind, as both involve the embrace of paradox and advanced meta-cognition about the self. Individuals in this stage must live divided between "an untransformed world" and a "transforming vision and loyalties," and this disconnect can lead individuals into developing rare universalizing faith systems of meaning-making.

Stage 6: Universalizing faith. Stage six represents a normative "image of mature faith" that was found to be present in only one interview participant [1]. Fowler describes these individuals as:

grounded in a oneness with the power of being or God. Their visions and commitments seem to free them for a passionate yet detached spending of the self in love. Such persons are devoted to overcoming division, oppression, and violence, and live in effective anticipatory response to an inbreaking commonwealth of love and justice, the reality of an inbreaking kingdom of God [3].

Developing a universalizing faith is seen as the "completion of a process of decentering from the self" [3], described by:

taking the perspectives of others...to the point where persons best described the Universalizing stage have completed that process of decentering from self. You could say that they have identified with or they have come to participate in the perspective of God. They begin to see and value through God rather than from the self...their community is universal in extent [3,4].

The goal of faith informatics, as a direction of inquiry, is to better understand the systems (social, ecological, information, or otherwise) that support faith development and how they can be improved. A tool for research, and perhaps an intervention in itself, may be an information system that allows an individual to gather faith-related data about themselves and then visualize and interact with these representations of the self.

A design paradigm for faith informatics

Figure 1 highlights the components of a potential faith informatics system based on a smartphone or other computing-based application (the "system"). The theory behind this system design is drawn from research interviews used by both Fowler in *Stages of Faith* and Kegan in the *subject object interview* [5]. Both researchers relied on what we call the "research interview" to determine the stages of faith (or, in Kegan's case, "forms of mind") present in the individual.



Figure 1. A depiction of a framework for designing faith informatics (FI) systems to support the elicitation and reflective revision of mental models of one's faith. The FI system prompts the user to systematically reflect on themself in the style of Fowler's faith development interviews [1]. This elicitation is combined with objective data about the individual's life and presented to the individual in a visualization. This visualization is then used to reciprocally influence the mental model the individual holds of their faith, facilitating development into further stages of faith.

The interview methodology relies on trained interviewers to communicate with and assess subjects using semi-structured interviews. Questions that might be asked in the interview include (selected from [1]):

- Thinking about yourself at present. What gives your life meaning? What makes life worth living for you?
- · At present, what relationships seem most important for your life?
- Have you experienced losses, crises or suffering that have changed or ``colored" your life in special ways?
- What experiences have affirmed or disturbed your sense of meaning?
- In what way do your beliefs and values find expression in your life?
- · When life seems most discouraging and hopeless, what holds you up or renews your hope?
- What is your image (or idea) of mature faith?

One critical insight is that this methodology, by asking these deep questions, appears to support development by itself. Jennfier Garvey Berger notes that individuals who undergo the subject-object interview "changed the way they were thinking about things in their lives" and wanted to "come back for another interview" [6]. Some individuals reported making significant life changes after the interview, such as leaving an unhealthy relationship [6]. Fowler, using his faith development interview, also notes that interviewees tend to say things along the lines of "I never get to talk about these kind of things" [1].

HCI researchers and practitioners can help make these "developmental interview" experiences more available to the general public. The subject object interview is noticeably costly, both in time required for the conducting of the interview (60 to 75 minutes per subject), as well as required training for the researcher. One potential avenue for faith informatics, therefore, is to attempt to recreate the essential conditions of developmental interviews, allowing for the deep reflection that occurs during the interviews.

For example, mobile or Web apps could attempt to recreate the conditions of a conversation that promote self-reflection and capture the outcomes of the reflection. This approach would be aligned with the notion of *reflective informatics*, which seeks to support reflective practices through technology [Z]. Research has already highlighted the promising effects of this kind of digital intervention. The "self-authoring" application, aligned with Kegan's forms of mind (particularly the *self-authoring form*) has been shown to improve academic performance, reduce gender and ethnic minority gaps, and improve general student outcomes through "future authoring."

In Figure 1, the hypothetical faith informatics system provides prompts to individuals about aspects of their life related to meaning-making. These prompts may draw from both Kegan's and Fowler's developmental interviews. In this particular diagram, we use the example from Fowler of eliciting the "life review," which seeks to break the life history into episodes of meaning [1], and allows for reflection on each stage in life. This is, in essence, a large-scale version of the day reconstruction method—a kind of *life reconstruction method*—where individuals can break their life up into discrete episodes that mark turning points in their development of meaning-making systems. We envision a role for interactive systems in providing an interface for eliciting the construction of these episodes and any associated metadata (e.g., real-world context).

This is one of the key benefits afforded by an informatics system: the possibility of incorporating real-world, objective data in these reflective dialogues. As an individual's system of meaning-making would be used for both answering prompts and governing an individual's behavior, the system can play a role in helping an individual compare their own perception of their meaning-making structures with how they (objectively) live their life. For example, life episodes could be colored by social contacts elicited from text messaging or email data, or behavioral activity derived from calendar entries or financial activities.

Faith informatics would therefore also connect with the field of personal visual analytics, where an individual's data (coming directly from the experiences described earlier) is visualized into an external representation that can enable the individual to confront their mental models of themself and of their life, potentially resulting in reciprocal feedback loops to prompt insights about and support faith development. The design and creation of these visualizations is an open challenge and may benefit from co-design activities and think-aloud visualization interaction studies.

We might expect that an individual's current stage of faith would inform design decisions. For example, an individual transitioning into stage 5 (conjunctive faith) may benefit from exploring objective data about their life history as they "reclaim and rework" [1] their past.

Facilitating social connections via faith informatics

Another promising avenue for faith informatics is that of fostering social connections that span both religious and non-religious faith traditions. While Fowler's stages of faith are largely based on Western religious traditions, it is possible (and perhaps likely) that similar developmental structures of meaning-making exist across religions and traditional beliefs worldwide, given the focus on *structure* of faith instead of *contents* of faith [1]. As such, faith informatics could facilitate the connection of individuals based on stage of development, rather than relying on religious communities that may suffer from the limits of particular modal developmental levels. Such a system could help to connect individuals in similar stages of faith across different cultures, facilitating connection and development, perhaps via the sharing of narratives and experiences.

Challenges and future work in faith informatics

Faith informatics is ripe with challenges and opportunities for the HCI community. One significant challenge is in the visualization of representations of faith that facilitate systematic reflection about an individual's meaning-making structures. While we can draw upon Fowler's research interview methodology to understand the types of prompts that may facilitate individual faith development, this kind of data (to our knowledge) has not previously been explored with contemporary visualization techniques. We expect that advances in personal visual analytics are necessary to support the effective visualization of self-reported faith data in a way that promotes development.

In addition, the HCI community must confront the undigitizable nature of faith and spirituality, especially with regard to users in the later stages of faith. Fowler only encountered one individual in stage 6, the *universalizing faith* stage. It may be difficult to attempt to reify late stages of faith in a digital system, especially when the presence of these stages is limited to few individuals. Future work could include in-depth interviews with individuals in these advanced stages of faith to better understand their life trajectory, in hopes of better understanding and sharing how they reached these particular forms of meaning-making.

Endnotes

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