Answers to Qualifying Exam Questions for Ron Houston

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QUESTION 1. Archivists long have been distressed at non-use of archival resources by those who, as archivists see them, could benefit readily and substantially from making use of this category of records information. Write an essay in which you: (1) define and exhibit a strong understanding of the nature and purpose of records information and archives, and (2) indicate the ways in which concepts of non-use of information might be applied effectively in the archival environment with the goal of achieving greater benefit to the public for its investment in archives. Knowing that the devil is in the details, please suggest concrete applications, not simply comfortable generalizations.

Question 1, part 1: Define and exhibit a strong understanding of the nature and purpose of records information and archives.

Overview of the nature and purpose of records information and archives

The nature and purpose of records information and archives derive directly from their development. In 1547, Spain saw the establishment of archives as an office, but the principles of archival practice came later. In 1794, the French Revolution established accountability of government through its archives and the citizen's right of access to government documents. French archivists codified the principle of organizing archives by creator in 1839-41. In 1881, Prussians developed the concept of maintaining original order as a reflection of the creator. The organic, integrated, and unique nature of archival records led to the continuing development of special organizational techniques (Bahmer, 1986). In the decades between the 1930s and the 1970s, the field of records management developed a set of organizing practices for records in offices, practices paralleling those of archival enterprise. This paper addresses only the American practices of records management and archival enterprise because terms and usages abroad differ (Gracy, 1999a).

The Life Cycle (the nature of records information and archives)

The life cycle of records bears a biological and even theological resemblance to the human life cycle: birth (creation), care (maintenance), death (end-of-use), and burial (disposal).

The cycle can be analyzed as a first life under records management and second life under archival enterprise.

First Life, under Records Management

Offices generate records in the course of business. Without management, these records would bankrupt the office through costs of storage and strangle the office through lack of access to needed records. Yet managing records can take time. Records managers intervene to prevent an office from doing *only* records management. In biological terms, records managers advise offices on the creation, maintenance, end of use, and disposal of records, a phenomenon called the "Records Cycle" (Benedon, 1986; Gracy, 1999b), not to be confused with "life cycle."

1 *Birth / Creation*: Records managers advise offices on the creation of document formats that facilitate handling, filing, retrieval, and use. For example, all forms should employ a similar physical size to facilitate digitizing and filing, and page layout should place information about the creator, recipient, purpose, and date of creation in the same location on each form.

2 *Care / Maintenance, and Death / End of Use*: Digital technology facilitates workflow, routing records electronically to the appropriate person for action. The original and any electronic copies then become grouped into records series or files to reduce the problems of scheduling, handling, and disposition. The records series then enter a Records Retention Schedule, which is a list of records by types, stating governing laws and regulations, lifespan limits, and methods of final disposal. Archival records move to archives facilities. Archivists and records managers, working together, appraise the different classifications of records series for enduring worth and formulate the Records Retention Schedule.

3 *Burial / Disposal*: Finally, records managers advise on methods of discarding documents that have fulfilled their first life and do not have a second life.

Second Life, under Archival Enterprise

Organically related, systematically maintained records with enduring value become the province of archival enterprise. Because records management developed apart from archival enterprise from the 1930s to the 1970s, the two fields developed different terminology. "Records" sent to archives become "documents." The word "archive" came from *archeion* (that which belongs to an office) and came to mean the foundations of power for an office, such as an administrative office. Now, archives refer to:

1. the **organically related** records of an organization or papers of an individual,
   (organic refers to the growth of the records from the activities of the creator and not an artificial collection of records by the creator)
2. **systematically maintained**,
3. now preserved in their **second life**, (with rare, first-life exceptions)
4. because of an **enduring value** to the information *in* the document and *about* the document.

Throughout archival enterprise, archivists maintain enduring value of documents by confirming or creating order in the documents and by preserving the authenticity of the documents. Archivists do this by leaving two "paper trails": a processing trail that documents all handling of the materials and a "finding aids" trail that records the results of processing the documents.

The purpose of archives

The purpose of archives can be inferred in part through its history, a history out of which grew two inviolate principles:

- *respect des fonds* [reh-SPEH duh FO^{N}] (respect of the estate) and
- *respect pour l'ordre primitif* [reh-SPEH poor LOR-druh pree-MEE-teef] (respect for the original order, sometimes called Registry Principle, or *provenance* [prov-NA^{N}S]).

Archivists observe the principle of *respect des fonds*, never mixing the items of one creator with those of another. Until the French Revolution, creating offices kept their own records, not distinguishing between current and historical records. French revolutionists established the right of citizen access to the records of government and adopted the renaissance concept of the archives office in 1794. Misguided efforts at organization by subject matter led in 1839-41 to *respect des fonds*, the principle of maintaining the records of a creator as an organic unit.

Creators know more about their creations than does the archivist, and original order itself gives meaning to items through context. Realizing this, Prussian archivists developed in 1881 a second principle, *respect pour l'ordre primitif*, retaining the filing structure of the creator (unless the structure does not reflect the activities of the creator).

Following this maintenance, archivists engage in a description of the archival material, a description called collective description, the description of the forest, not the trees (Schellenberg, 1965). Because each archive contains unique, related material, a description of the "trees" would not reflect the creator.

The purpose, then, of records information and archives consists in part of preserving something of a time-and-space portal to allow researchers in the here-and-now to access information about a creator in the there-and-then, whether that creator be an individual, a group, an organization, or an office, as originally intended.

Preserving this portal, however, comprises only part of the purpose of records information and archives. The other part, equally important, consists of bringing the information in the archives to fruitful union with the mind of the researcher, to paraphrase Jesse Shera (1970, p. 30). This joining of material and mind takes two forms, usually combined: user education and archival reference enterprise. Unlike libraries, in which uniform methods of access apply to all institutions, archives contain unique material, organized uniquely. Beyond the principles stated above, archives have very few common organizational schemes. As in

libraries, research begins with the "reference" interview. The archivist's role diminishes as the researcher becomes familiar with the repository's finding aids, but an archivist always delivers the needed material to the user in an area of restricted access, such as a designated reading room. In an open-stack library, a patron can browse the shelves effectively, but not so in archival repositories where stacks remain closed and objects remain hidden behind cryptic labels. Archives browsing would be futile and a threat to the integrity of the materials, violating the "preserving the portal" aspect of archival enterprise.

Alas, the wisest preservation and reference activities remain pointless if patrons do not use the archival materials, so archivists began to investigate marketing strategies to increase patronage. They still investigate marketing strategies, indicating the lack of effectiveness of prior strategies. Therefore, Part 2 addresses marketing of archives, hopefully from a more promising perspective, that of "non-use of information."

Question 1, part 2: Indicate the ways in which concepts of non-use of information might be applied effectively in the archival environment with the goal of achieving greater benefit to the public for its investment in archives. Knowing that the devil is in the details, please suggest concrete applications, not simply comfortable generalizations.

Target audiences

One marketing target includes a group that seeks to increase patronage of archives: archives administrators, governors, regulators, funders, donors of archival materials, and marketing consultants. The second group includes patrons: those who try unsuccessfully to conduct research in archival facilities and those who do not conduct research in archival facilities. The latter have received most of the attention in the literature of archives marketing, a literature created by the former, and this paper will broaden that attention to the former.

Effective and efficient marketing campaigns require specified audiences and goals. For the purposes of this paper, and because of the importance of the patron in any information institution (Lincoln, 2002, p. 145; cf. Kotler & Andreasen, 1996, p. 36), the audience will be the

patron or potential patron, and the goal will be to increase service to them. Many of the suggestions, however, apply also to marketing campaigns directed toward governors, regulators, funders, and donors. To avoid confusion," the word "patron" will refer to a user of *archives*, and the word "user" generally will refer to a user of *information*.

Manifestations of non-use of information that appear in marketing of archives

Manifestations of non-use of information, as presented in this answer, derive from my preliminary dissertation work. They include:

- Avoidance of Information Overload, and Resignation
- Filtering
- Mental Manifestations other than Filtering
- Desire for Disengagement
- External Manifestations: authoritarian controls

Avoidance of Information Overload, and Resignation

Non-use of information results from both *avoidance* of information overload (Perrow, 1989; Rutsky, 1999) and from the *overload*, itself (J.G. Miller, Galanter, & Pribram, 1960). Overload can create a feeling of helplessness, a feeling that manifests as *resignation*, a giving up instead of keeping up (Wurman, 1989, p. 34). To avoid overload, most people filter information, as explained next. The clever marketer will keep the marketing message short and simple to minimize overload and will take advantage of filtering, as follows.

Filtering

In filtering, the information user accepts some information and, by definition, rejects other information (after James, 1890). Filtering embraces several behaviors that apply to different levels of selectivity of information, starting with anti-intellectualism.

"Anti-intellectualism" refers to a mistrust of the "life of the mind" and of those who represent it (Hofstadter, 1963). Hofstadter identified three highly controversial fonts of anti-intellectualism: religion, corporate culture, & populism. People argue about these fonts, but few would deny their existence. A clever marketer would identify any fonts of anti-intellectualism among the target audience and nullify the arguments of those fonts. For example, to the adherents to a populist movement who see archives as a bastion of the ruling elite, a marketing campaign would present archives as the legal refuge of the ruled, protecting the rights of the weak against usurpation by the powerful.

Similar in effect to "anti-intellectualism," "avoidance of the unknown" appears in studies of new users of libraries (Mellon, 1986; Kuhlthau, 1988) and of novice users of libraries basing expectations on previous, unfortunate library experiences (Jiao & Onwuegbuzie, 1997). Against "avoidance of the unknown," the marketer should know that potential patrons of archives do not understand the nature, use, or value of archives or archivists (Dionne, 2002, pp. 190-194) because, whether or not "avoidance" takes place, archives certainly are "unknown" to most. Perhaps a change in terminology from "archive" to something simple, such as "house of truth" or "home of history" would lure the unknowing *patron*. For *administrators* who reject a marketing campaign because the ideas involved are unfamiliar, or because previous ventures with unknown ideas have resulted in misfortune, the outlook is bleak. These administrators must be educated, overridden, or replaced with a person more open to innovation.

At other levels of filtering selectivity, consider David Gracy's story of the man who walked into an archives and asked to see an "old" document. He left, satisfied with only the entertainment value of "old," and excluding the "real" information of the document's contents. Marshall McLuhan documented this phenomenon, implying that "the medium is the message" and, therefore, sufficient to occupy the receiver and even to divert attention and awareness from the message (McLuhan & Fiore, 1967). This manifestation could be the easiest to confront. Many archives contain immense entertainment value in their anecdotes of life, death, love, war,

adventure, fortune, and romance. These elements could provide the "hook" with which the competent marketer lures potential patrons into an archival facility, a "hook" more formally termed "Awareness" and "Interest," the first two of the four elements of the A-I-D-A marketing communication model (de Sáez, 2002, p. 83). McLuhan's observation also involves the hypnotic lure of the flickering screen. That effect appears to have carried over to the computer screen, suggesting that digitization of archives would increase use of archives among those now addicted to television and computer screens, whether those screens were in the archives facility or in the user's home via the Web.

Filtering by rejection of information from sources outside a person's trusted world has been discussed extensively in the literature of information science (e.g., Chatman, 1985a, 1987b, 1991a; Chatman & Pendleton, 1995; Hersberger, 2001). To extrapolate: to increase patronage of their facilities, administrators of archives generally turn to their colleagues, to marketers, and to articles and books about marketing. This pattern of behavior has persisted for years; yet, the fact of its persistence indicates its lack of success. In this situation of avoidance of outside information, administrators, being somewhat used to being educated, should be taught to seek marketing techniques outside their normal channels. Failing that, the marketer could try to convince the administrator's opinion leaders (journals, editors, educators) to publicize new tactics. Rejection of information from non-trusted sources occurs also among potential patrons. While archivists view archives as perhaps one of the most trusted sources of information, the societally disadvantaged so thoroughly described by Chatman et al. (1985a; 1987b; 1991a; 1995) and referred to by Lukenbill (2002) might disagree. According to Chatman et al., this disadvantaged segment of society trusts primarily its "opinion leaders," those who provide an interface between them and the larger society or possess other sources of cognitive authority. In this situation, the marketer of archives must target the opinion leaders with the techniques discussed elsewhere in this paper.

In the case of filtering by "avoidance of conflicting information," the user rejects information that conflicts with a previous mindset. For example, potential viewers of the archived de la Peña diaries might not view them because they contradict the popular treatment of Davy Crockett's death at the Alamo. "Avoidance of cognitive dissonance" (Festinger, 1957) resembles avoidance of conflicting information, except that the person avoiding cognitive dissonance modifies the conflicting information rather than avoiding it. For example, "The de la Peña diaries don't really name Davy at all." Attribution theory (Weiner, 1974) resembles cognitive dissonance in that the person again modifies the conflicting information rather than rejecting it. Generalizing broadly, attribution theory states that we explain our own misfortunes as the result of *external* causes and our own good fortune as the result of *internal* causes. When we act badly, "circumstances forced me to do it." When we act well, "that's just the way I am." Conversely, when others act badly, "they are evil," and when others act well, "they had no choice." The effect that attribution theory has on non-use of information lies in its obscuring other motivations. For example, "Davy had to protect his men." Or: "De la Peña lied to hurt Santa Anna." As with cognitive dissonance, attribution theory cannot be detected by the person who is "refusing" to accept another explanation. If an *administrator* ignored factors that decrease the desirability of use of the archival facility, such as an abrasive reference archivist or dirty floors, it would nullify a marketing campaign. Or an administrator might ignore the dismal history of marketing of archives and repeat the unsuccessful campaigns of that history. A *patron* might not seek information from an archive for fear of discovering undesirable information, as mentioned with the de la Peña diaries. To the patron who avoids conflicting information, offer platitudes such as "You will know the truth, and the truth will make you free." However, the *administrator* who ignores conflicting information dooms a marketing campaign and must be monitored by those less susceptible to the effects of the information, i.e., the governors and regulators.

In the library setting, filtering by "perceived cost exceeds perceived benefit" takes the form of Mooers' Law: "An information retrieval system will tend *not* to be used whenever it is

more painful and troublesome for a customer to have information than for him not to have it." (Mooers, 1960, p. 204) Others empirically furthered Mooer's Law and emphasized the importance of cost *over* benefit, concluding: "the preference for a given method reflects the estimated ease of use [time, distance, or intellectual effort] of the method rather than the amount of information expected." (Rosenberg, 1966, p. 453) An earlier manifestation of cost-benefit that emphasizes the importance of cost *over* benefit is "satisficing," proposed by Herbert Simon in 1955. Satisficing postulates that, lacking the will to perform the comprehensive calculations of a cost-benefit analysis, most people trade decision-making effort for a merely satisfactory level of calculations (Byron, 1998; citing Simon, 1955). In marketing of archives, the administrator weighs the time involved in collecting the information, either for the preliminary market study or at the conclusion of the campaign, against the expected benefits. However, to avoid the overemphasis on cost pointed out by Rosenberg and Simon, the administrator must follow a pre-established marketing plan to its end. The archives patron weighs the value of the expected archival information against the difficulty of acquiring it, including getting to and into the facility, searching the holdings, and retaining representations of the information, e.g., by photocopying or taking notes. Any marketing campaign should acknowledge the importance of Mooer's Law, Rosenberg's findings, and Simon's satisficing by stressing the ease of getting to the facility, the ease and speed of using the finding aids or reference staff, and the ease of retaining any information found.

Filtering occurs with more than information. Beyond information, per se, lies a need for information to fit with previously acquired information. This phenomenon, called apperception, is “a process where new ideas associate themselves with old ones that already constitute a mind” (Bigge & Shermis, 1999, p. 147) and extends back to John Locke's *An Essay Concerning Human Understanding* (Sieber, 2002). Non-use of information also results when the user dismisses information as trivial or irrelevant (Case, 2002, p. 95; Dervin, 1983a, p. 170). For example, the prisoners in Chatman's 1999 study of a prison (Chatman, 1999), to function in

their "small world," simply did not need information from the outside world. Having limited physical and emotional resources, they rejected information not essential to survival. In education: "Only when subject matter is perceived as being relevant to a person's own purposes will a significant amount of learning take place." (Wurman, 2001, p. 86; quoting Rogers, 1969) The assumption of cumulative progress in human knowledge results occasionally in a dismissal of the "old-fashioned," as in the Great Proletarian Cultural Revolution in China of 1966-1968. Ironically, archives provide one of the best defenses against the overuse of such a manifestation by preserving "old" information, while such a manifestation might prevent the use of archives through the perception of archives as containing *only* "old" information. Finally, filtering can eliminate information without *structure*: "People in any situation will search for meaningful relations between the variables existing in the situation, and if no such relations exist or can be perceived, considerable discomfort occurs." {Garner, 1962 #168, p. 339-340;quoted in \Case, 2002 #135, p. 99;see also \Piaget, 1952 #278, p. 6} In this manner, bits of otherwise productive and relevant information can lack structure and result in non-use of information. Piaget (1952, p. 6) proposed a similar, more encompassing psychological phenomenon called incoherence, a sense that knowledge is successfully self-referential, a psychological experience that the parts fit, that life makes sense. To address successfully these filterings, a marketing campaign might emulate the game "Trivial Pursuit" in glorifying the isolated datum, the obscure, and the old. Indeed, the entire concept of "game" might provoke the "desire" component of the A-I-D-A communication model (de Sáez, 2002, p. 83).

Mental Manifestations Other Than Filtering

Howard Gardner (1983) defined intelligence as "the human ability to solve problems or to make something that is valued in one or more cultures." (Checkley, 1997) To previous theories of linguistic and graphical intelligence, Gardner's theory added the intelligences of musical, logical-mathematical, spatial, body-kinesthetic, intra-personal (such as insight), and

inter-personal (such as social skills). The intelligences rarely operate independently of each other but are used concurrently (Gardner, 1983). Gardner's theory affects non-use of information. A person whose strength lies in kinesthetic intelligence, for example, would not use information of a mathematical nature as readily as would a "mathematical" person, perhaps resulting in non-use of information. Therefore, a marketing campaign should use multimedia presentations to appeal to multiple intelligences. Second, archives have the image of catering to linguistic intelligence, yet many archives contain audio and video recordings, photographs, and other non-traditional media. To reach more than the linguistically intelligent, a campaign should promote the availability of non-traditional media. The Library of Congress American Memory Historical Collections Website provides a good example of a multimedia presentation.

Tarzan deciphered written English with no conception of the phenomenon of written language, and we perhaps are skeptical. We may feel that awareness of the *phenomenon* of written language constitutes a *threshold* of knowledge required for literacy. Knowledge thresholds also occur in less dramatic settings: "there is something about the uninformed that makes them harder to reach." (Hyman & Sheatsley, 1947) Beyond lack of threshold knowledge, an ignorance of the very *sources* of information brands a person as one of the "information poor," one who "does not know which formal channels to tap in order to solve his problems" (Childers & Post, 1975, p. 42). This definition now includes the people who lack threshold knowledge of the digital world (Wurman, 2001, p. 13) and therefore do not use its information. Yet even the "information rich" lack threshold knowledge in some areas, e.g., the library setting, where patrons are inexperienced in the use of information retrieval tools (Belkin, 2000a; 2000b). Naïve conceptions, a mental manifestation related to a lack of threshold knowledge, involves not so much a *lack* of knowledge as the *possession* of misconceptions that block new information. This phenomenon finds explication in experiments describing the interference with science education of prior misconceptions (Eaton, Anderson, & Smith, 1983; Reiner, Slotta, Chi, & Resnick, 2000). As with lack of threshold knowledge, the result of naïve conceptions

resembles "avoidance of conflicting information." However, naïve conceptions in this sense actually block the acceptance of additional information. These mental manifestations of non-use of information could affect any marketing campaign for archives by restricting the information that an administrator accepts. For example, the administrator may know classical marketing techniques and reject more recent marketing innovations. These mental manifestations of non-use of information are extremely difficult to counter. They also affect potential users of archives. Dionne (2002, pp. 190-191) has described the work of David Gracy and James Boylan in portraying the public image of archives and the archivist as not "entirely favorable." Any marketing campaign that hopes to overcome such misconceptions and lack of threshold knowledge might take note of the medical profession's self-makeover at the beginning of the 20th century, e.g., *The Flexner Report* (Flexner, 1910). In other words, ignore entirely the negative images and "flood the market" with positive images as did the medical profession.

Desire for Disengagement

Disengagement, found among those who could patronize archives but do not, could be attributed to a number of causes. Some might wish to withdraw from all of society. Others might view archival institutions as representing a inamicable power structure (cf. Lukenbill, 2002, p. 170). Some might wish to forget their own past and identity. In these cases, archives outreach and education campaigns will be counterproductive, reinforcing the very image of archival enterprise from which the non-patron wishes to disengage. Marketing under these circumstances would be situation-specific. For example, a campaign directed toward disengaged Native Americans would stress the ability of archived documents, e.g., treaties, to aid in the recovery of stolen lands.

External Manifestations: authoritarian controls

Authoritarian control occurs when an agency (e.g., government, society, institution, situation of work or enslavement, family) controls the behavior of an individual. A bureaucracy,

for example, might forget its mission and have its own perpetuation as a goal (cf. Castells, 2000, p. 187). A marketing plan for an archival institution, proposed by an administrator or by a marketing consultant, could be changed by a parent organization, a governing board, a regulatory professional association, influential funders, or influential donors of archival material. If the original plan had been done properly, a change could reflect non-use of information. For the patron, family, peer pressure, opinion leaders, censors, or other representatives of society could restrict information. Other than fomenting rebellion, the marketing campaign can do little against authoritarian control. In this case, the archival institution must bide its time, because when faced with authoritarian control, the archive "wins" if it only survives, while the controller "loses" if it does not prevail utterly.

Summarized Recommendations

To overcome non-use of information, a marketing campaign for archives might want to consider the techniques suggested in this paper.

For **administrators**: Keep the plan simple. Consider previously untried methods. Convince the administrator's opinion leaders (journals, editors, educators) to promote new tactics in marketing campaigns. Monitor administrators to see that they correct unpleasant aspects of their institutions and that they follow the marketing plan and not cut short any gathering of information simply because the information they have seems to be sufficient.

For **patrons**: Identify fonts of anti-intellectualism, and present archives as a refuge from the fonts. Use simple words, such as "home of history," instead of "archive." Utilize the entertainment value of archives as the "hook" to entice patrons. Digitize and place archives on the computer screen. Demonstrate the desirability of archives to the opinion leaders of the target audience. Stress the ease of getting to the facility, the ease and speed of using the finding aids or reference staff, and the ease of retaining any information found. Glorify the

isolated datum, the obscure, and the old, through a game concept. Use multimedia presentations and focus on the multimedia nature of the materials in the archives. Follow the strategy of the medical profession in making over the public image of archives and archivists. Link the interests of potential patrons to the contents of archives.

Conclusion

"Non-use of information" can provide a new lens through which to examine the non-use of archives.

QUESTION 2. As you know, the whole idea of non-use of information is very interesting from a psychological perspective, and I cannot help but connect the idea to many literatures in my field such as the work on expertise, on schema change, and on engagement, for example. In this question, I would like for you to discuss how you understand the psychology of non-use, its causes and manifestations as a psychological phenomenon.

So that the committee and I will be working from a common vocabulary, I will discuss briefly the history of foci of information science and then the history of schools of psychology. Then I will discuss my understanding of various areas of psychology, with the appropriate manifestations of non-use of information "mapped" to each area.

Introduction

Speaking broadly, information science (in its early incarnations as librarianship and documentation) began with a "systems" approach to information behavior, focusing on systems of organizing information, e.g., card catalogs. In other words, systems were designed, and people adapted to them. In about 1966, a "user turn" occurred in the information science literature, with a shift in focus to user needs and behavior (e.g., Parker, 1966; Herner & Herner, 1967; Menzel, 1966). In other words, research began to focus on adapting systems to users. In about 1977, a "cognitive turn" occurred, exploring the cognitive processes behind user behavior (e.g., de May, 1977; Bandura & Adams, 1977). In the 1980s, "cognitive" expanded to "socio-cognitive" {e.g., \Capurro, 1985 #832;cf. \Hjørland, 2002 #803}. Human-computer interaction (HCI) became a popular topic (e.g., Marchionini, 1991, 1992), although many researchers continued to study systems, users, and user cognition.

Again speaking broadly, psychology expanded from its early focus on introspection and sensory perception (e.g., James, 1890) into psychoanalytic psychology or "psychodynamics" (e.g., Freud, 1913 & 1923), Gestalt psychology (e.g., Köhler, 1929), behaviorism (e.g., Pavlov, 1928; Watson, 1914 & 1967; Skinner, 1938), and cognitive psychology (e.g., Newell, Shaw, & Simon, 1957; Broadbent, 1958). Each of these schools of psychology addresses certain aspects of non-use of information. This paper does not consider developments since 1980 because "not

enough time has elapsed to judge their long-term impact on the field." (Atkinson, Atkinson, Smith, Bem, & Nolen-Hoeksema, 1993, p. A-9)

This paper will follow the cognitive school of psychology, formalized by Neisser (1967). Although cognitive psychology makes wide use of the analogy of "information-processing systems" (Atkinson et al., 1993; e.g., Newell et al., 1957), it shares with information science a lack of literature about the *non-use* of information. To explore the psychological aspects of non-use of information, I will "map" manifestations of non-use of information to the school of cognitive psychology. These manifestations come from my preliminary dissertation research, which identified approximately 40 manifestations. Not all areas of cognitive psychology apply to non-use of information, and some manifestations of non-use of information employ aspects of psychology from other schools, such as psychodynamics and behaviorism. Cognitive psychologists employ a number of classificatory schemes for their discipline, but the following appears to be a comprehensive list of its areas of study: Perception, Memory and Learning, Knowledge Representation, Language, and Thinking. Cognitive psychology "has been expanded to all areas of psychology, including motivation, perception, psychopathology, and social psychology" (Atkinson et al., 1993, p. A-13). However, Dreyfus (1992) and Searle (1992) describe a lack of attention to Emotion and Consciousness by cognitive psychology as shortcomings of this school of psychology. Therefore, Emotion and Consciousness will be discussed in terms of psychodynamics and behaviorism.

Although cognitive theories occur in the field of Abnormal Psychology, the school of cognitive psychology largely ignores psychopathology other than its brief treatment of psychosis as a manifestation of creativity (e.g., C. Smith & Hodgson, 2005). This paper will map non-use of information to areas of cognitive psychology and try to deal with psychological aspects of non-use of information without labeling them as abnormal, bad, irrational, or pathological.

The "Perception" Area of Cognitive Psychology

The first sub-area of the "perception" area of cognitive psychology includes "Attention" and "Filter" theories, which imply a withdrawal of attention from some things in order to deal effectively with others (after James, 1890). This area also includes the psychodynamic defense mechanisms popularized by Freud, of which Flood (1975) says: "the filtering mechanism actually serves as a physiologic and psychologic homeostatic mechanism." (cf. Bayliss, 1966; J.G. Miller, 1960) Homeostasis, first identified as the constancy of the "milieu interieur" (internal environment) by 19th century French physiologist Claude Bernard, may explain neural habituation and Zipf's principle of least effort (Zipf, 1949), in which "least effort," e.g., not using information, maximizes stasis, the goal and result of homeostasis. Wilson reminds us that "filtering behavior (or 'nonuse,' as he calls it) is both efficient and perfectly rational if it is a matter of conscious POLICY: being presented with more information than one could absorb" (Lamb, 1995a, p. 94-94; citing P. Wilson, 1995, p. 45-46). Filtering mechanisms are presented next. While the order in which they appear could be viewed as "irrational to rational," it also could be viewed as "less selective to more selective" and avoid the pejorative label of "irrational."

Information, by definition, must be unknown before it becomes information (if it already were known, it would not be information). "Avoidance of the unknown" represents the most omnibus filtering. The literature of non-use of information presents this filtering as a "testing of constructs, in which encounters with new situations frequently begin with negative feelings" (Case, 2002, p. 100; citing Kelly, 1963; and Kuhlthau, 1988). "Avoidance of the unknown" appears in studies of new users of libraries (Mellon, 1986; Kuhlthau, 1988) and of novice users basing future fears on previous, unfortunate experiences (Jiao & Onwuegbuzie, 1997). No precise parallel for avoidance of the unknown exists among psychodynamic defense mechanisms.

Anti-intellectualism, a "resentment and suspicion of the life of the mind and of those who are considered to represent it" (Hofstadter, 1963), filters information as a psycho-social

phenomenon, involving as it does a suspicion of others. Filtering also can occur on the individual level, and several manifestations of non-use of information relate to it.

Csikszentmihalyi (1990) refers to psychological engrossment as "flow." Others have distinguished and presented gradations of the phenomenon under the label "involvement." Involvement begins as "interest" and deepens into a process of "engagement" through the development of motives and strategies for further pursuit of the subject of interest. After a bit of self-regulation during which the information user still exercises volition over the use or non-use of the information, *engagement* narrows into a state of *involvement* (Reed, Schallert, & Deithloff, 2002). Under this classification, "involvement" wholly absorbs the information user and precludes the use of other information. Engrossment can involve the *use* of information, as in the example of a scholar engrossed in research, but as explained here, it also could refer to an introspective engrossment in which outside information is *not* used.

Avoidance of *real* information represents a less extreme case of anti-intellectual filtering. Marshall McLuhan documented this phenomenon, implying that "the medium is the message" and, therefore, sufficient to occupy the receiver and even to divert attention and awareness from the message (McLuhan & Fiore, 1967). Another perspective (Case, 2002, p. 102-108) maintains strongly the contrary viewpoint that entertainment IS information. This avoidance of information can be *described* by the filtering theories of cognitive psychology, but *explanation* would have to come from schools of psychology that dealt more directly with motivation, such as psychodynamic theories of defense mechanisms, or behavioral theories of reward / punishment. Other cases of filtering of outside information, involving a higher level of cognition, appear below, under "Thinking."

The above cases represent information from outside. Selective memory represents a similar phenomenon, but from "inside," from memory. As above, filtering theory provides a *description* of the manifestation, where schools of psychology that discuss motivation would

provide an *explanation*. The psychodynamic school of psychology attributes filtering and selective memory to defense mechanisms such as repression, suppression, and denial.

Priming, or selective attention, almost seems to be the opposite of avoidance of conflicting information, in that it is the acceptance of selected information rather than its rejection. For example, a news report of a UFO sighting causes people to observe objects in the sky, resulting in more UFO sightings. On a more affective level, filtering of television viewing tends to mitigate extremes of emotion, e.g., overexcited people chose calm programs, and bored people chose exciting programs (Zillman & Bryant, 1985; Atkin, 1985; Pearlin, 1959; Henning & Vorderer, 2001).

Non-use of information can result from both the *avoidance* of information overload (Perrow, 1989; Rutsky, 1999) and from the *overload*, itself (J.G. Miller et al., 1960). The former is filtering, while the latter invokes physical limitations, described below. Speaking psychodynamically, the opposite of information overload, commonly known as boredom or information lack, seems to appeal to the human psyche almost as little as information overload (Kuhlthau, 1993b; Zillman & Bryant, 1985; O'Reilly, 1980). Both information overload and lack lead to "information anxiety," defined by Wurman as the gap between what we understand and what we think we should understand (Case, 2002, p. 99-100; citing Wurman, 1989). In extreme form, information anxiety leads to a feeling of helplessness, expressed as *resignation*, or giving up instead of keeping up (Wurman, 1989). As a physical interpretation of overload, the brain has a maximum capacity for receiving signals, a rate at which signals can pass no more frequently. When the number or frequency of signals exceeds that capacity, further signals are lost, resulting in non-use of information. In some cases, the body will shut down some channels to save resources for other information acquiring on other channels (Csikszentmihalyi, 1990, p. 28). In some cases, an excess of signals affects memory, resulting in "overload amnesia" (Wurman, 2001, p. 57-58) or short-term memory loss (Wurman, 2001, p. 57).

The second sub-area of perception consists of "pattern recognition," the ability to correctly interpret ambiguous sensory information through statistical/decision theoretic or syntactic/structural schemes. Pattern recognition overlaps "Thinking" and "Memory/Learning" areas of cognitive psychology in describing manifestations of non-use of information. Pattern recognition here differs from the "Thinking" area in that it appears to apply at a more *sensory* level, e.g., to optical or auditory patterns, where "Thinking" applies more to *cognitive* pattern recognition. Pattern recognition overlaps "memory and learning" in the topic of constructed memories, described in the next section.

The "Memory and Learning" Area of Cognitive Psychology

Memory, or its non-use, seems to be one step removed from non-use of information in that it is a non-repetition of a potential use of information, rather than a non-use of information. However, two sub-areas of "memory and learning" merit discussion: "constructive memory," and "encoding, storing, and retrieving."

Constructive memory, defined as memory augmented by a person's prior knowledge and expectancies rather than derived only from sensory input (Atkinson et al., 1993, p.322), overlaps *cognitive* pattern recognition, described below under "Thinking," because a lack of pattern frequently prompts the construction of a memory to complete the pattern, termed "schema" by Bartlett (1932). When this happens, misconceptions can block new information, a phenomenon called "naïve conceptions." In the field of physics education, Reiner et al. (2000; quoting diSessa, 1988, p. 50) summarized the problem and the research into naïve conceptions. Naïve conceptions resemble "avoidance of conflicting information," described below.

"Encoding, storing and retrieving" memory-based information applies to two manifestations of non-use of information: "selective memory" and "amnesia." Selective memory represents the "information from inside" component of "filtering," above. It also overlaps the Thinking area of cognitive psychology, described below. While selective memory, by definition,

results in the selective use of some information and, therefore, the non-use of other information, its *causes* vary. For example, *strength of attitude*, i.e., the strength to which a person clings to a belief, affects what that person can remember (Pomerantz, Chaiken, & Tordesillas, 1995). For another example, *abuse* produces a number of personal problems, including selective memory (Graur, 1996; citing Gil, 1983). The more irrevocable manifestations of selective memory might better be termed "amnesia."

Cognitive psychology can *describe* the "Memory and Learning" manifestations of non-use of information, but *explanation* has required psychodynamic labels, such as those employed by Anderson and his colleagues, including suppression (M.C. Anderson, Bjork, & Bjork, 1994; M.C. Anderson & Green, 2000; M.C. Anderson & Bell, 2001), inhibition (M.C. Anderson & Spellman, 1995), interference (M.C. Anderson & McCulloch, 1999; M.C. Anderson, 2003), retrieval-induced forgetting (M.C. Anderson, Bjork, & Bjork, 2000), and repression (M.C. Anderson & Green, 2001).

Knowledge representation - The "Knowledge Representation" area of cognitive psychology appears to resemble Bartlett's "schemata" (Bartlett, 1932), a concept discussed in *sensory* pattern recognition (above), "Memory and Learning" (above), and "Thinking" (below).

Language - The "Language" area of cognitive psychology does not appear to be reflected directly or prominently among the psychological aspects of non-use of information. However, language and language skills *acquisition* appears frequently in the literature of manifestations of non-use of information (e.g., "tuning out" in Do & Schallert, 2004; "lack of threshold knowledge" in R.C. Anderson, Reynolds, Schallert, & Goetz, 1977; and Lee & Schallert, 1997; "information overload" in Liu, Schallert, & Carroll, 2004). These manifestations are discussed elsewhere.

The "Thinking" Area of Cognitive Psychology

This area overlaps "filtering," described above. The manifestations of non-use of information discussed here, however, require a greater degree of user cognition than did those described under "filtering."

According to studies of the disadvantaged classes of society (Chatman, 1985a, 1987b, 1991a; Chatman & Pendleton, 1995; Hersberger, 2001), non-use of outside information involves prejudice (a filtering manifestation) and reasoning resulting from concept formation (described below). Avoidance of *bad news* is more specific than avoidance of *outside* information and thus involves more user cognition. Miller has used this manifestation of non-use of information to identify medical patients as information seekers, whom he terms "monitors" and information rejecters, whom he terms "blunters" (S.M. Miller, 1987). Numerous studies have verified Miller's concepts (e.g., Pifalo, Hollander, Henderson, DeSalvo, & Gill, 1997; Leydon et al., 2000). Maslow included emotion and affect (discussed below) when he applied this manifestation more broadly, saying: "we can seek knowledge in order to reduce anxiety and we can also AVOID knowing in order to reduce anxiety." (Case, 2002, p. 99; quoting Maslow, 1963, p. 122) Maslow used "knowledge" synonymously with "information." Avoidance of *conflicting* information requires more cognition than avoidance of bad news, in that the user avoids a subset of bad news, the bad news that conflicts with previous information, rather than a nebulous and unspecified "bad news." Avoidance of *conflicting* information inhibits the use of information in any situation (Kuhlthau, 1993a, p. 341-341; citing Kelly & Maher, 1969, p. 151), for example, "any significant learning involves a certain amount of pain, either pain connected with the learning itself or distress connected with giving up certain previous learnings." (Wurman, 2001, p. 241; quoting Rogers, 1969).

"Cost-benefit analysis" generally requires more cognition than the foregoing manifestations of non-use of information. In one form, information acquisition diverts mental resources from other purposes or other information acquiring. Even without the juggling of

mental resources, this manifestation can be expressed as an avoidance of information requiring effort, money, or time. In the library setting, cost-benefit takes the form of Mooers' Law: "An information retrieval system will tend *not* to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it." (Mooers, 1960, p. 204) Others empirically furthered Mooer's Law and emphasized the importance of cost *over* benefit, concluding: "the preference for a given method reflects the estimated ease of use [time, distance, or intellectual effort] of the method rather than the amount of information expected." (Rosenberg, 1966, p. 453) An earlier manifestation of cost-benefit that also emphasizes the importance of cost over benefit is "satisficing," proposed by Herbert Simon in 1955. Satisficing postulates that, lacking the will to perform the comprehensive calculations of a cost-benefit analysis, most people trade decision-making effort for a merely satisfactory level of calculations (Byron, 1998; citing Simon, 1955). For these people, the rational behavior of comprehensive calculations is bounded by various limits such as effort and time, giving rise to the name "Bounded Rationality."

An interesting exception to cost-benefit occurs in Bereiter and Scardamalia's theory of expertise (Bereiter & Scardamalia, 1993). They postulate a personality type, the expert, as one who continues to use information well past the point of cost-benefit equivalency. In fact, their expert never ceases to accept information, making expertise a process, rather than a state of being. Intelligence "type" also characterizes experts and is discussed below.

Beyond information itself, lies *structure*. A lack of structure can result in non-use of information. Bartlett (1932) called structure in a user a "schema." Piaget called the fitting of information to previously acquired information "apperception." In this usage, apperception views the mind as “a framework on which ideas can be hung. Thus, teachers function like architects and builders of minds” (Wurman, 2001, p. 258). Another definition of apperception as “a process where new ideas associate themselves with old ones that already constitute a mind” (Bigge & Shermis, 1999, p. 147), extends back to John Locke's *An Essay Concerning Human*

Understanding (Sieber, 2002). For structure in *information* (rather than in the *user*), Piaget (1952, p. 6) proposed the term *incoherence*, a sense that knowledge is self-referential, a psychological experience that the parts fit, that life makes sense. "People in any situation will search for meaningful relations between the variables existing in the situation, and if no such relations exist or can be perceived, considerable discomfort occurs." (Garner, 1962, p. 339-340; quoted in Case, 2002, p. 99) Without structure, bits of relevant information can be lost through non-use of information.

Non-use of information also results when the user dismisses information as trivial or irrelevant (Case, 2002, p. 95; Dervin, 1983a, p. 170). For example, the prisoners in Chatman's 1999 study of a prison (Chatman, 1999), to function in their "small world," simply did not need information from the outside world. Having limited physical and emotional resources, they rejected information not essential to survival. In education: "Only when subject matter is perceived as being relevant to a person's own purposes will a significant amount of learning take place." (Wurman, 2001, p. 86; quoting Rogers, 1969) In education, filtering by perceived irrelevance could be caused by a lack of threshold information. Tarzan of the Apes deciphered written English with no conception of the phenomenon of written language, and we perhaps are skeptical. We may feel that awareness of the *phenomenon* of written language constitutes a *threshold* of knowledge required for literacy. Knowledge thresholds also occur in less dramatic situations: "some people are chronically ignorant in relation to the topic of the information campaign and there is something about the uninformed that makes them harder to reach." (Hyman & Sheatsley, 1947) Both of these examples apply to education. The inability to find (or recognize) relevant information amid so much, e.g., in the case of the Internet (Wurman, 2001, p. 13), constitutes a special case of "lack of information threshold." Beyond ignorance of *issues*, ignorance of the very *sources* of information brands a person as one of the "information poor," one who "does not know which formal channels to tap in order to solve his problems" (Childers & Post, 1975, p. 42). This definition, coined 15 years before the advent of the World Wide Web,

now includes the many people who lack threshold knowledge of the digital world (Wurman, 2001, p. 13) and, therefore, non-volitionally do not use its information. Yet, even the "information rich" lack threshold knowledge in some areas, as Belkin (2000a; 2000b) has demonstrated in the library setting.

Two other psychological mechanisms result in the non-use of information: cognitive dissonance and attribution theory. Cognitive dissonance (Festinger, 1957) provokes non-use of information when the information challenges a previously emplaced fundamental emotional or mental construct. Psychodynamic defense mechanisms that parallel cognitive dissonance include suppression, denial, and rationalization. Attribution theory (Weiner, 1974) resembles cognitive dissonance in that the person again modifies the conflicting information rather than rejecting it. Generalizing broadly, attribution theory states that we explain our own misfortunes as the result of *external* causes and our own good fortune as the result of *internal* causes. When we act badly, "circumstances forced me to do it." When we act well, "that's just the way I am." Conversely, when others act badly, "they are evil," and when others act well, "they had no choice." The effect that attribution theory has on non-use of information lies in its obscuring other motivations. Psychodynamic defense mechanisms that parallel attribution theory include suppression, projection, and rationalization.

The literature of non-use of information contains two problems in measuring information: the problem of *inert* knowledge, and the problem of *encapsulated* knowledge. *Inert* knowledge (Whitehead, 1929), when a person has accepted but not manifested the use of information, presents difficulties to the measurement of use of information, a measurement that depends on behavioral manifestation. Whitehead referred to information that changed a person's memory but had no manifestation that an educator, for instance, could test (reported in Bereiter & Scardamalia, 1985, p. 61 and endnote 3:21). *Encapsulated* knowledge, also of concern to educators, refers to knowledge manifested in one situation, which has not manifested in another situation (Bereiter & Scardamalia, 1993, p. 67). For example, a student who scores highly on a

statistics examination might then not be able to analyze the results of an experiment using the same techniques. This phenomenon resembles Ryle's differentiation between declarative (formal, technical, "knowing that," "knowing about," or propositional) knowledge and procedural (also called informal, practical, or "knowing how") knowledge (Ryle, 1949). Bereiter and Scardamalia's "experts" have and use both types of knowledge (Bereiter & Scardamalia, 1993, p. 44). Ryle's classification calls to mind that of Howard Gardner. Gardner defines intelligence as "the human ability to solve problems or to make something that is valued in one or more cultures." (Checkley, 1997) To previous theories of linguistic and graphical intelligence, Gardner's theory added intelligences in musical, logical-mathematical, spatial, body-kinesthetic, intra-personal (such as insight), and inter-personal (such as social skills). The intelligences rarely operate independently of each other but are used concurrently (Gardner, 1983). Gardner's theory affects non-use of information. A person whose strength lies in kinesthetic intelligence, for example, would not use information of a mathematical nature as readily as would a "mathematical" person, perhaps resulting in non-use of information.

In cognitive psychology, creativity comprises a part of the "problem solving" sub-area of the "Thinking" area. Other aspects of creativity exist, and perhaps other schools of psychology explain them better. Experimental psychology indicates that *creativity* correlates positively in scientists to *curiosity* (Maizell, 1960). Psychopathology does not receive the extensive treatment in cognitive psychology that it receives in, for example, psychodynamics, but it does appear as a corollary to creativity (C. Smith & Hodgson, 2005). Lack of creativity or curiosity can, perhaps, lead to less behavior indicating psychopathology, which some might refer to as "good," but it also can cause non-use of information, which some might refer to as "bad." This indicates the importance of avoiding value judgments when discussing non-use of information.

The "Emotion" Area of Cognitive Psychology

Emotion does not appear prominently in cognitive psychology, occupying more of a "catch-all" status. The literatures of other disciplines and of other schools of psychology provide reviews of affect literature, for example, of affect influencing classroom participation (Do & Schallert, 2004), and of the nebulous nature of words such as "mood" and "emotion" (Kobayashi, Schallert, & Ogren, 2003). Mood and emotion deserve discussion here as causes of non-use of information. *Mood* implies a longer duration and less intensity than emotion, and it influences non-use more in the *search* for information than in the *encounter* with information. "Mood is a stance or attitude that the user assumes which opens or closes the range of possibilities in a search." (Kuhlthau, 1993a) Similarly: "people are more prone to seeking information when they are in a good mood." (Case, 2002, p. 100; quoting Batson, Coke, Chard, Smith, & Taliaferro, 1979) *Emotion* influences several aspects of the non-use of information as discussed in this paper, including filtering and selective memory (e.g., Nabi, 1999).

The "Consciousness" Area of Cognitive Psychology

Consciousness also occupies a "catch-all" position in cognitive psychology. The study of consciousness would seem to lend itself to introspection, a prominent tool of the early "structuralism" school of psychology, somewhat ignored in subsequent schools as difficult to verify experimentally. Any effect of consciousness on non-use of information might be explained more concisely through other schools of psychology or other sub-areas of cognitive psychology.

Other manifestations of non-use of information

In my dissertation research, I have identified four other manifestations: disengagement, authoritarian controls, information poverty, and social isolation, which describe the *results* of non-use more than they describe the psychological aspects of non-use. Their psychological aspects are treated in other parts of this section of this paper, although they are not identified.

Conclusion to question 2

From this exercise, I conclude that my model of non-use of information does not map neatly to the school of cognitive psychology. This is surprising, because cognitive psychology apparently was founded on an "information-processing" model. Any discipline, as it undergoes the Hegelian dialectic, moves from one extreme to the other. Perhaps cognitive psychology, in distancing itself from the introspection and deterministic behaviorism of previous schools, needlessly ignored these rather fundamental aspects of human behavior. Many of the manifestations of non-use of information could be explained by these two aspects, limiting the ability of cognitive psychology to explain non-use of information.

QUESTION 3. You have just written a Qualifying Exam Research proposal entitled "A Theory of Non-Use of Information: An Analysis of Manifestations Appearing in Published Literatures," and you have recently written extensively about the evolution of Vannevar Bush's "memex" concept in the literatures of information science, librarianship, education, marketing, and literary criticism. Although Bush is cited frequently, particularly his "As We May Think" (AWMT) article, he appears to retain an ambiguous place in LIS history. This ambiguity makes difficult the answering of the "So What?" question as it applies to Bush's "AWMT" concepts.

How did the apparent beneficiaries of Bush's AWMT article (Licklider, Engelbart, Nelson, and Berners-Lee) assess the significance of Bush's work in the development of information science and technology, and how did their assessment reflect the non-use of information, if it did at all?

Historical background

Vannevar Bush published his famous "As We May Think" (AWMT) article in the July 1945 *Atlantic Monthly* (Bush, 1945a) with an illustrated condensation in *Life* (Bush, 1945b), an anonymous summary in *Time* (Anon. & Bush, 1945), and a reprint in his 1946 book, *Endless Horizons* (Bush, 1945 & 1946). Between 1959 and 1970 he continually revised and re-published his concept, and many editors have reprinted his original essay (e.g., Sharp, 1964a, p. 19-41; Kochen, 1967c, p. 23-35; Pylyshyn, 1970, p. 47-59).

Following the 1945 publication of AWMT, librarians viewed Bush and the article with ambiguity (e.g., Bar-Hillel, 1957, p. 110) or lack of enthusiasm (e.g. Fairthorne, 1958, p. 135-136; 1961 & 1968, p. 135-136; J.H. Wilson, 1966, p. 119). In 1960, perhaps as some of Bush's predictions began to come true with the popularization of microforms, librarians began to laud Bush (e.g., Brownson, 1960 & 1964, p. 631; Hayes & Becker, 1970, p. 25; De Gennaro, 1979, p. 2406). With the development of the digital computer, however, some librarians withdrew support, perhaps because of the computer's threat to libraries heavily invested in microform storage (e.g., De Gennaro, 1985, p. 39).

Also during the 1960s, computer pioneer Douglas C. Engelbart and hypertext pioneer Theodor H. Nelson had begun to respond to AWMT and perhaps to influence other information science pioneers, such as J.C.R. Licklider and Tim Berners-Lee (see Appendix 1). Since then, dozens of authors have called Bush the "father of information science."

Did Bush really envision what we know as hypertext via digital computers? In fact, while Bush *did* know the state of development of digital computers (Randell, 1982c, p. 409; citing Bush, 1936) and had tried to build a digital computer in 1937-38 (Randell, 1982a, p. 66-67; citing Radford, 1938; Radford, 1939), he abandoned digital computers in 1940 (Randell, 1982a, p. 66-67), disavowed any part in their development (Bush, 1970, p. 185), and ignored the development of the ENIAC, the first digital computer (Stern, 1978, p. 46; Kurzweill, 1990, p. 198). In 1965, Bush finally published an endorsement of digital technology (Bush, 1965 & 1967 & 1991).

Bush's reputation as the father of information science (with AWMT being the discipline's birth cry) increased, ironically, through trivialization and misrepresentation. Disregard or *trivialization* of Bush's vastly important concept (i.e., the defining of the memex personal knowledge management (KM) function as only an information retrieval (IR) function) became so common that Nelson (1972 & 1991, p. 248) re-published excerpts from Bush's AWMT, stating that the memex "runs counter to virtually all work being pursued under the name of information retrieval today."

In addition to trivialization, *misinterpretation* occurred. In 1976, Vagianos stated that the Bush memex could revolutionize libraries through the librarian's giving, rather than lending, "a new unit of information" on microform (Vagianos, 1976, p. 155). In other words, Vagianos focused on the microform storage function of memex rather than its KM function.

In 1981, Smith used citation context to analyze the impact of AWMT and updated that analysis in 1991 (L.C. Smith, 1981, 1991). In these analyses, Smith examined the historical context, hardware, and IR and KM functionality presented in AWMT, concluding that: "the article has been used as a symbol for a number of different concepts. Although most citing authors affirm various viewpoints presented by Bush, there have been critics." Smith cites Bar-Hillel (mentioned above) as one such critic of the KM aspect of the memex when he said that the idea

of approximating the association of ideas in the human mind by a co-occurrence chain of indexes to be traced by machine held very little promise (L.C. Smith, 1991, p. 272).

Buckland (2003, p. 680) cited himself and Smith in summing up nicely the state of misinterpretation of Bush.

> [T]he iconic status of Vannevar Bush and his essay "As We May Think" is doubly interesting as a case study: first as a cult phenomena [*sic*] in its own right, examined by Smith (1981,1991); and secondly in showing how a lack of historical awareness results in an uncritical, mythic tradition, and the erasure of history (Buckland, 1992).

Buckland's "erasure of history" refers here to his 1992 exposure of the tendency in the literature of information science to identify the birth of the discipline via the 1945 publishing of AWMT, thus ignoring earlier landmarks: the 1920s innovations of Emanuel Goldberg; the prognostications of Paul Otlet (1934) and Walter Schurmeyer (1935); Bush's earlier writings about the memex (1932-1939); and electronic document retrieval technology (Buckland, 1992a, p. 284).

The more one examines Bush's reputation, the more variability emerges. From "crank" to "icon," authors in a number of disciplines have expressed opinions, usually based on the writings of others, but occasionally revealing original research. Stories abound *about* Nelson, Engelberg, Lidicker, and Berners-Lee, revealing huge non-use of information. However, accounts *by* these four present a different picture.

The following four sections of this paper discuss the manifestations of non-use of information employed by these four pioneers of information science in their assessments of Bush's work. The manifestations come from my dissertation work.

Theodor H. Nelson's benefits from, and assessment of, Bush's work

Ted Nelson, a "professional visionary" (so-called by Berners-Lee & Fischetti, 1999, p. 5), cited Bush as an inspiration (1965, p. 84) and began the project that was to become "Xanadu"

in 1960 (McCracken, 1999, p. 138; Project Xanadu, 2001). Based on his reading of AWMT, Nelson also coined the term "hypertext" in either 1960 (Nelson, 1987, p. 0/2) or 1963 (Project Xanadu, 2001), or 1965 (Nelson, 1965, p. 96). Nelson defined hypertext as "non-sequential writing with reader-controlled links" in his *Literary Machines* (Nelson, 1987, p. 0/2). In this, he appears to have understood Bush quite accurately and done much to further a justifiable Bush legacy by expressing more succinctly Bush's concepts of KM.

Did Nelson assess Bush's work correctly? Did Nelson deliberately and accurately use the available information about Bush's work? The literature indicates that the answer to both questions is an unqualified "yes."

Nelson, as mentioned above, developed his concept of hypertext from an accurate understanding of the KM concepts in AWMT. In fact, he expressed quite strongly his view that the memex performed KM rather than IR, stating that the memex "runs counter to virtually all work being pursued under the name of information retrieval today." (Nelson, 1972 & 1991, p. 248)

Nelson had no illusions that Bush's memex could be built and, unlike some writers (e.g., De Gennaro, 1985), he did not denigrate Bush for not building it. Instead, he followed the memex technology to its culmination in Bush's Rapid Selector and based his opinion on fact.

> [S]uch a machine required new kinds of filing arrangements . . . associative trails . . . Two decades later, this machine is still unavailable. . . . The Bush Rapid Selector is a powerful microfilm instrument, but it is not suited to idiosyncratic personal uses, nor to evolutionary modifications, as described. (Nelson, 1965, p. 86)

Nelson recognized the shortcomings of Bush's technology while acknowledging Bush's vision. He implied credit to Bush even for his *own* improvements: e.g., Nelson's system "would provide an up-to-date index of its own contents (supplanting the 'codebook' suggested by Bush). . . . It would provide for filing in Bush trails." (Nelson, 1965, p. 88)

Interestingly, Nelson may have slyly remonstrated with Bush for Bush's refusal to accept digital computers. In 1965, Bush said:

> We will not expect our personal machine of the future, our memex, to do the job of the great computers. But we can expect it to do clever things for us in the handling of the mass of data we insert into it. (Bush, 1965 & 1967 & 1991, pp. 94-95)

In the same year, at a time when few people were reading Bush, Nelson countered:

> Despite changing economics, it is fashionably believed that computers are possessed only by huge organizations to be used only for vast corporate tasks or intricate scientific calculations. (Nelson, 1965, p. 85)

Whether Nelson was responding to Bush or not, he was aware of Bush's continued work at a time when many information scientists were *citing*, but had not *read*, AWMT:

> We must once again have a community of common access to a shared heritage. This was of course what Vannevar Bush said in 1945 (in an article everybody cites but nobody reads). . . . Bush's article has been taken as the starting point for the field of Information retrieval, but its actual contents have been ignored by acclamation. (Nelson, 1974, p. 84)

Nelson read and understood Bush. He credited Bush for inspiring his revolutionary ideas, specifically hypertext. By virtue of the above examples, I believe that Nelson assessed Bush's work accurately and employed none of the manifestations of non-use of information. However, when Nelson (cited above) said "[S]uch a machine required new kinds of filing arrangements . . . associative trails . . . Two decades later, this machine is still unavailable," he demonstrated his own status as a prophet of information science, not a pioneer, prior to the development of the personal computer. With the development of the PC and the realization of his dreams, he became a pioneer. Therefore, if Nelson was a prophet until the 1980s, Bush was even more of a prophet in 1945 and, like Nelson, not a pioneer. In other words, Bush was a godfather of information science, not a father.

Douglas C. Engelbart's benefits from, and assessment of, Bush's work

Engelbart read AWMT in 1945. In 1961, he discussed the importance of user-centered design in *American Documentation*:

> There are several good papers to which I would like to call your attention, which present various associated and supporting views regarding special aid for the individual. The most directly relevant is one that many of you may already be aware of, a paper by Vannevar Bush, whose arguments of fifteen years ago could hardly be bettered for today's case. I.J. Good and J.C.R. Licklider present relevant and very stimulating thoughts, also. (Engelbart, 1961, p. 124)

Engelbart wrote to Bush in 1962 (Engelbart, 1962 & 1991, p. 235-236), stating somewhat ambiguously:

> this article of yours has probably influenced me quite basically. . . . I wouldn't be surprised at all if the reading of this article sixteen and a half years ago hadn't had a real influence upon the course of my thoughts and actions.

In 1963, Engelbart wrote:

> Bush is the earliest and one of the most directly stimulating" individuals with regard to providing speculations and possibilities of using a computer in real-time working association with a human to improve working effectiveness. (Engelbart, 1963, p. 26)

Engelbart later explained that Bush's guidance must have been subliminal, because he did not consciously remember the memex until after he had envisioned the digital computer with its cathode ray tube display" (Waldrop, 2001, p. 216). Waldrop (2001, p. 216) explained this apparent discrepancy in Engelbart's statements:

> Although he hadn't consciously based his own ideas on Bush's, says Engelbart--his own statement was already in close to its final form by the time he remembered the Memex--he still believed that even unconscious debts should be acknowledged.

Did Engelbart benefit from Bush's work? Engelbart thought so, with respect to his 1963 oN Line System (NLS). The systems share vague conceptual underpinnings, such as a focus on user needs. Engelbart wrote about AWMT (and Good and Licklider) while he was developing NLS. But he also called the benefit subliminal (represented in Appendix 1 as a dotted line), and subsequent authors would do well not to exaggerate his words. As a final benefit, Engelbart wrote rather formally and stiffly and probably welcomed Bush's written justification of a user-centered information system. If this is true, it would explain Engelbart's letter of praise to Bush, a letter in which Engelbart requested (and received) permission to reprint portions of AWMT.

Did Engelbart assess Bush's work correctly? Ironically, Engelbart credited the weakest part of Bush's memex, its technological aspect. Engelbart developed what we know now as the digital computer display and mouse, aspects that Bush would not recognize in the days of optical microfilm readers. Engelbart also accurately assessed Bush's focus on the user. Engelbart remained silent, however, on the incredibly farsighted memex aspects of KM through association.

Did Engelbart deliberately and accurately use the available information about Bush's work? Probably not entirely. Because Engelbart remained silent on KM, we cannot know for certain whether or not he appreciated Bush's contribution to that topic. Engelbart focused on the technology and on user-centered design, and the KM features of the memex probably were irrelevant to his needs. This would be a manifestation of "avoidance of apparently irrelevant information," an example of the volitional non-use, or "filtering," of information. Ironically, his contribution to the PC made possible Nelson's manifestation of Bush's KM as hypertext.

J.C.R. Licklider's benefits from, and assessment of, Bush's work

Licklider joined the Advanced Research Projects Agency in 1962 to head their Behavioral Sciences and Command and Control units, positions from which he essentially planned ARPANET, which evolved into the Internet (Waldrop, 2001, p. 201), but he did not read

Bush until 1965 (Kahn & Nyce, 1991b, p. 136-7). For example, Licklider's famous manifesto "Man-Computer Symbiosis" (1960) does not mention Bush or memex. His *Libraries of the Future* refers to Bush only in its prefatory materials:

Verner W. Clapp, in the "Foreword," wrote:

> Vannevar Bush pointed out in the article [AWMT] that may be said to have opened the current campaign on the 'information problem' [quotation from AWMT]. . . . 'How shall one explore the future?' In this manner, too, the pattern was set by Dr. Bush in his 1945 article . . . in which he invented the 'Memex,' the private memory device in which all a man's records may be stored, linked by associative indexing and instantly ready for his use. (Clapp, 1965, p. v, vii)

Licklider, in the "Preface," dedicated the book to Bush:

> I had often heard about Memex and its 'trails of references.' I had hoped to demonstrate Symbiont to Dr. Bush as a small step in the direction in which he had pointed in his pioneer article. But I had not read the article. Now that I have read it, I should like to dedicate this book, however unworthy it may be, to Dr. Bush. (Licklider, 1965, pp. xii-xiii)

Did Licklider benefit from Bush's work? In a sense, yes. Although Licklider had never read Bush, he *did* know about Bush's desire to augment human cognition through mechanical means. Licklider probably would have developed ARPANET without this knowledge, but Licklider's knowing that another prominent scientist thought the idea worth pursuing must have encouraged him. Interestingly, for all his talk of Bush's desire to make "a man's records . . . ready for his use," Licklider instead developed a system wherein the records of a large number of scientists became available for *each other's* use.

Did Licklider assess accurately Bush's work? If we view Bush's expression of the concept of KM by associative trails as Bush's most important work, then yes, Licklider accurately assessed Bush's work.

Did Licklider's assessment reflect non-use of information? Licklider paralleled Bush's work and knew of Bush's work. Yet, Licklider did not read Bush's work until his own "Manifesto" and book *Libraries of the Future* had been written. This suggests that Licklider engaged in a cost-benefit analysis and viewed his own knowledge of Bush's works as sufficient. He possibly did not feel that he could "afford" the time to read Bush until his publishing deadlines had been met. This manifestation of non-use of information is the "filtering" behavior of "satisficing."

Tim Berners-Lee's benefits from, and assessment of, Bush's work

Berners-Lee said little about Bush and the memex. Like Licklider, he pursued a parallel course and later discovered Bush. Unlike Licklider, he apparently had not even *heard* of Bush:

> Unbeknownst to me at that early stage in my thinking, several people had hit upon similar concepts, which were never implemented. Vannevar Bush . . . wrote about a photo-electro-mechanical machine called the Memex, which could, by a process of binary coding, photocells, and instant photography, make and follow cross-references among microfilm documents. (Berners-Lee & Fischetti, 1999, p. 5)

With the advantage over Engelbart and Licklider of historical perspective, Berners-Lee accurately assessed his own contributions and those of the other pioneers:

> Doug Engelbart, a researcher at Stanford University, demonstrated a collaborative workspace called NLS (oN Line System) in the 1960s. . . . Unfortunately, just like Bush and Nelson, Doug was too far ahead of his time. . . . I happened to come along with time, and the right interest and inclination, after hypertext and the Internet had come of age. The task left to me was to marry them together. (Berners-Lee & Fischetti, 1999, p. 6)

Berners-Lee has been asked: "Have your first ideas in regard to the Web been influenced by any specific work or published paper like Vanevar Bush's 'As we may think', a

publication of Doug Engelbart or Ted Nelson?" Berners-Lee (circa 2000) published an answer on his Website:

> There wasn't a direct line. . . . I came across Vannevar Bush's article first in the documentation of Digital Equipment Corporation's "Memex" project which became "Linkworks" for VMS. I don't remember when that came out [VMS was demonstrated in 1991]. Great paper. (cf. Berners-Lee & Fischetti, 1999, p. 5)

Did Berners-Lee benefit from Bush's work? As demonstrated in Appendix 1, the answer only can be "indirectly." Bush's work did influence Nelson, and Berners-Lee utilized the Nelson's hypertext concept for the creation of the Web. Bush's work may have had a subliminal influence on Engelbart, who then influenced the development of the personal computer, and Nelson did require the personal computer in his implementation of hypertext. Bush's existence as a scientist interested in man-machine symbiosis may have encouraged Licklider to develop the proto-Internet, and Berners-Lee did require hypertext and the Internet in his creation of the Web.

Did Berners-Lee's assess accurately Bush's work? As far as his "Great paper" goes, the literature of information science would say that Berners-Lee did assess AWMT accurately. Berners-Lee has not written about Bush's other works.

Did Berners-Lee's assessment reflect non-use of information? Berner-Lee's work did not require knowledge or awareness of Bush's work, being a generation removed from Bush's work. In that sense, his assessment does not reflect a non-use of information.

Summary of assessments and non-use of information

Bush could be considered something of a conceptual godparent to the developments of Nelson, Engelbart, and Licklider. They, in turn, were conceptual godparents to Berners-Lee's Web. Would the Web exist today without Bush? Most probably, but perhaps not quite as we know it or in as advanced a state as we know it today.

Nelson read, understood, and credited Bush for inspiring hypertext; the location of ideas through associative linking. Engelbart used and credited the weakest part of Bush's memex, its technological aspect. If we view Bush's expression of the concept of KM by associative trails as Bush's most important work, then yes, Licklider accurately assessed Bush's work. Berners-Lee used Bush's work very indirectly in his development of the Web and admired Bush's work when he later read it.

With respect to AWMT, Nelson displayed no manifestations of non-use of information. Engelbart manifested "avoidance of apparently irrelevant information." Licklider manifested the "filtering" behavior of "satisficing." Berners-Lee neither needed nor used AWMT.

Conclusions: Who to believe?

Nelson, Engelbart, Licklider, and Berners-Lee created much of the substance of today's information science, with its emphasis on the computer, the Web, and knowledge management. They, if anyone, would know its origins. All four used aspects of the information contained in Bush's AWMT, and, of the four, only Nelson acknowledges a direct contribution by Bush. However, dozens of authors have called Bush the "father of information science," generally citing each other. Who to believe? I suggest that these other authors have not used the information available from Nelson, Engelbart, Licklider, and Berners-Lee.

That being said, I must point out that the non-use of information by these other, uninformed authors inspired the development of information science, where accuracy might have discouraged it. For that reason, "non-use of information" must not be viewed as inherently bad or good. It just *is*.

And as for Bush: as we credit Jules Verne for his vision and inspiration, rather than as father of the 1969 moon landing, information science might well memorialize Bush as a prophet and reserve the title "father" for those who built the computer, the Web, and KM: Nelson, Engelbart, Licklider, and Berners-Lee.

QUESTION 4. With the recent "user turn" in our discipline and cognate fields, the importance of affect has been increasingly emphasized in the study of information behavior. We might consider, for example, the work of Chatman, Kuhlthau, and Mellon as indicative of this trend.

Given this and related work as a background to your own investigation, how does the concept of nonuse of information have the potential to help us further understand information behavior? Please do not provide a typology as the basis of your response, but rather focus on two or three specific, extended, in-depth examples.

Following the synopses of the histories of information science and psychology given for Question 2, above, I now will discuss the work of Chatman, Kuhlthau, and Mellon, highlighting aspects of psychology, particularly affective psychology, that manifest within their works, and applying to each example my investigations into non-use of information.

Elfreda A. Chatman [1942-2002]

Chatman is best remembered for championing the ethnographic research methodology in the discipline of library and information science (LIS) and for her studies of information behavior among the societally disadvantaged. From 1983 to 1987, Chatman produced a doctoral dissertation and five articles based on her study of 50 poor women enrolled in an urban CETA (Comprehensive Employment and Training Act) program (Chatman, 1983, 1984, 1985a, 1985b, 1986, 1987a). These writings established Chatman's interest in conducting research through ethnographic studies of the information behavior of the poor. From 1987 to 1991, Chatman published three articles based on her study of 51 library janitors (Chatman, 1987b, 1990, 1991a). These articles discussed information barriers such as low reading skills, alienation from society, and a need for immediate gratification, continuing her emphasis on using ethnographic methodology for the study of information behavior among the poor. In 1991, Chatman published an article based on her study of 55 elderly women living in a retirement community (Chatman, 1991b). She further described this population in her book (Chatman, 1992a), exploring in both article and book the irrelevance of public library services to these women. These writings continued Chatman's emphasis on ethnographic methodology in the

study of information behavior, but they expanded her subject populations from the poor to the more general class of the societally disadvantaged. In 1995, Chatman and Victoria E. M. Pendleton used Chatman's janitor study to explain the "knowledge gap" in terms of information barriers to the poor (Chatman & Pendleton, 1995). In 1996, Chatman used her studies of the 50 CETA women, the 51 janitors, and the 55 elderly women to suggest behavioral traits that led to information poverty when compounded by the knowledge gap (Chatman, 1996). In 1998, again with Pendleton, Chatman postulated the determinants of the "small world" of the information poor (Chatman & Pendleton, 1998). These articles demonstrated the durability of Chatman's ethnographic methodology and Chatman's continued interest in the societally disadvantaged. In 1999, Chatman published a study of 80 female maximum-security prison inmates. This study suggested that a lack of information in itself created a lifestyle based on that lack and survival strategies that did not rely on information for success. This period of her work continued to substantiate Chatman's faith in ethnographic methodology and her interest in the societally disadvantaged, this time from a psychological perspective. In 1999, Chatman expanded her research themes to question fundamental assumptions such as the assumption of the need for information in a "normative" existence (Chatman, 1999). In 2001, Dawson and Chatman distilled the essence of Chatman's views on information behavior from the somewhat situation-specific "small world" and "opinion leaders" to the more general "reference group," a group composed of "significant others in a person's life" (Dawson & Chatman, 2001a). Also in 2001, Burnett, Besant, and Chatman (2001b) applied Chatman's theories of normative behavior to virtual communities (newsgroups and listserves) and to feminist bookselling. Through much of her career, Chatman related her work to a need for public librarians to change their methods to better serve the societally disadvantaged.

The early Chatman work suggested manifestations of non-use of information. For example, her studies of the educated CETA women demonstrated that education, not income, determined a preference for information from print media over TV. The preference for print

media, and its absence among other, less-educated groups, indicates that education provides a threshold knowledge, the lack of which causes non-use of information. The CETA women also demonstrated a willingness to follow opinion leaders, a manifestation that depends more on the nature of leadership than on information, per se. Chatman described these leaders as possessing greater social participation, gregariousness, greater exposure to the mass media, and being more cosmopolitan. She also noted that these opinion leaders did *not* share information about job opportunities with their followers. These characteristics label this manifestation of non-use of information as "authoritarian control," in which one agency controls the behavior of another, sharing some information and withholding other information for the benefit of the controller.

Chatman's studies of janitors demonstrated a preference for information from TV and a disinclination to read except occasionally for newspapers and the Bible. She attributed these preferences to low reading skills and to psychological and social barriers. The preference for TV resembles an avoidance of real information, as described in Marshall McLuhan's *The Medium is the Massage* [sic] (McLuhan & Fiore, 1967). Here, the medium is sufficient to occupy the receiver and even to divert attention and awareness from the message that might be contained in the TV broadcasts and in print media. On a more affective level, filtered television viewing tends to mitigate extremes of emotion, e.g., overexcited people chose calm programs, and bored people chose exciting programs (Zillman & Bryant, 1985; Atkin, 1985; Pearlin, 1959; Henning & Vorderer, 2001). (Unfortunately, no one has determined what sort of mood prompts the seeking of education!) Chatman's reference to newspapers and the Bible brings to mind Richard Hofstadter's identification of three fonts of anti-intellectualism: religion, corporate culture, & populism (Hofstadter, 1963), although her reports bore no mention of a phenomenon resembling anti-intellectualism. Chatman's janitors did not seek information from their neighbors because of work schedules, because they felt their neighbors to be undesirable, and because

they felt that their neighbors would know no more than they knew, suggesting "perceived cost exceeds perceived benefit" as a manifestation of non-use of information.

Chatman's studies among elderly women (average age 82) demonstrated a preference for information from what the women termed "educational" TV and print media such as books and magazines, but not from the public library, because of their in-house library and the perception that the public library did not contain information of interest to them. Education here again appears to have created a required threshold of knowledge, avoiding one cause of non-use of information. Failure to patronize the public library appears to be a manifestation of "perceived cost exceeds perceived benefit," both in the sense that traveling to the library would be troublesome and in the sense that the library held little interest for the women beyond the interests that could be satisfied at the in-house library.

Chatman and Victoria Pendleton began to synthesize these studies. In 1995, they published a "knowledge gap" theory (Chatman & Pendleton, 1995), postulating that mass media were perceived by the poor as sources of information for the "media rich" but not responsive to the needs of the poor. This appears to be a shift from a combination of volitional and non-volitional manifestations to purely non-volitional manifestations of non-use of information. Specifically, it appears to be a shift from avoidance of real information; perceived cost exceeds perceived benefit, and lack of threshold knowledge to a non-volitional authoritarian control in which some undefined power structure controls the media. If Chatman's observations are accurate and representative, then this shift might represent a manifestation of Wurman's resignation (Wurman, 1989), undoubtedly accompanied by mechanisms of affect.

Chatman (1998) then synthesized her studies under a "small world" construct, stating that social norms, world view, social types, and information behavior determine a person's "small world." In 1999, Chatman and Pendleton published a theory of "life in the round" (Chatman, 1999), stating that prisoners lived a normative existence based on normative behavior, ignoring "outside" information under all but the most critical situations in which their

"small world" was not functioning to permit their survival. These appear to be very pragmatic expressions of filtering manifestations such as "avoidance of outside information," "perceived cost exceeds perceived benefit," Simon's "satisficing," and "avoidance of apperception or irrelevance or triviality of information." These manifestations appeared in Chatman's subsequent collaborations, the studies of on-line "virtual" communities and of feminist booksellers, but with two differences. First, information behavior among prisoners probably included the non-volitional manifestations of lack of threshold information (e.g., illiteracy) and authoritarian control (e.g., censorship), factors that probably played a smaller part in the information behavior of those outside prison. Second, the intensity of affect in prison (e.g., fear, depression, anxiety, frustration) probably rendered non-use of information less volitional than on the outside.

Carol C. Kuhlthau

Kuhlthau helped to define much of the "user turn" in librarianship. According to Kimmo Tuominen (1997), she based her theory of "user uncertainty" first on the romanticism found in the works of philosopher John Dewey (1933) and personal construct theories of psychologists George A. Kelly (1963) and Jerome Bruner (1986). Later, Edward E. Sampson (1993) expressed this view of the user as a kind of monologism, viewing the user as having a relatively coherent, constant, and independent identity (Tuominen, 1997). Kuhlthau followed Robert Taylor's negotiation approach to the reference interview (Taylor, 1968) and, more directly, followed Nick Belkin's "anomalous state of knowledge (ASK) approach (Belkin, 1980).

Although Kuhlthau published her "process" approach to information seeking in 1985 (Kuhlthau, 1985), she formulated recognizable elements of it in 1981 (Kuhlthau, 1981). In 1987, she began to publish about the cognitive elements of her search process (Kuhlthau, 1987), and in 1988, she began to incorporate affect and behavior (Kuhlthau, 1988), giving information science her three-legged socio-cognitive approach to information seeking (cognition, affect, and behavior). Through these changes in emphasis, she has maintained the process approach to

this date (e.g., Kuhlthau, 2005). Briefly, that approach postulates six stages in the information seeking process: initiation, selection, exploration, formulation, collection, and presentation.

Widely respected as an author, researcher, thinker, and theoretician, Kuhlthau seldom is cited critically. In 1997, however, Tuominen (1997) examined Kuhlthau's 1993 process "manifesto" (Kuhlthau, 1993b) through discourse analysis. Tuominen identified several assumptions that limit the applicability of Kuhlthau's search process to a practice of science "whose ultimate aim is to predict and control." (Kuhlthau, 1993b, p. 21) Tuominen portrayed Kuhlthau's contribution to the "user turn" as, ironically, another manifestation of the "systems approach," with the library and its reference staff becoming the system, rather than the card catalog or the computerized database. In other words, Tuominen determined that Kuhlthau's transforming the librarian from a "locator" of information sources to a user's "counselor" or "sense-maker" who would "get inside the head" of the user actually gave the librarian power similar in nature (but not in degree) to a physician or lawyer and made the user subservient to the librarian. Tuominen felt that viewing the librarian as independent of cultural and linguistic constraints, and blaming the opacity of a library's information system on a lack of user threshold knowledge or search methodology, benefited the library, not the user. Tuominen's article has interesting ramifications for the marketing of archives, discussed in question 1, above.

Two manifestations of non-use of information suggest themselves as applicable to Kuhlthau's work. Both can be phrased in terms of affect. In the first, a user might view the emotional *cost* of submitting to the control of a librarian's information seeking process as greater than any possible *benefit* to be derived from the experience, and not submit. Whether this not submitting results in not going to the library or whether it results in walking out before information has been found, the result is the same, non-use of information. The second case appears most prominently in three of Kuhlthau's works (1988; 1991; 1993a), in which she discusses the influence of the role of the defense mechanism "avoidance of the unknown" and the resultant negative emotions that libraries generate in novice library users (the vast majority

of the population, actually) when they approach libraries. Kuhlthau's early articles referred to these negative emotions as "fear" or "anxiety," but later writings used "uncertainty," and that word reappears throughout her writings, becoming a central factor in the search process (e.g., Kuhlthau, 1999). (Unfortunately, she at times used "uncertainty" also as an emotionally neutral synonym for "not knowing.") In the 1991 article, Kuhlthau suggested user education to overcome user uncertainty, but a more complete understanding of non-use of information would indicate the non-volitional nature of defense mechanisms and the need for extraordinary measures to overcome them. Kuhlthau mentions other manifestations of non-use of information, but they can be included with "avoidance of the unknown," if "unknown" is interpreted broadly. For example, Kuhlthau refers to avoidance of information overload as aversive in the same context as avoidance of the unknown and, conversely, avoidance of boredom (Kuhlthau, 1993a). In short, Kuhlthau may have increased the emotional distress of submitting to authoritarian control in a library setting, while trying to reduce the emotional distress of novice library users.

Constance A. Mellon

School librarians know Mellon for her dozens of book reviews, for her discussions of non-traditional library instruction, for her advocacy of school librarian involvement in the educational process, for her advocacy of disadvantaged children, and for her recent inquiry into the role of computerized or on-line education. Information scientists know her as their champion of Grounded Theory (Mellon, 1986) and Naturalistic Inquiry (Mellon & Pagles, 1987; Mellon, 1990) as research methodologies, and that is the role in which she will be discussed here.

Mellon early on discovered the importance of the *user* in the library situation and the importance of *affect* in the user. She used Grounded Theory to establish to others that some 80% of first-time academic library users experienced anxiety (Mellon, 1986). She reinforced the shift in library science from systems to people with her publication the next year about

naturalistic inquiry and its application to bibliographic instruction (Mellon & Pagles, 1987). In 1988, Mellon stated explicitly the effect of affect on bibliographic instruction:

> the emotional attitudes that students bring to the learning situation strongly affect what and how much will be learned. Where anxiety is present, it must be allayed before the work of instruction can begin. (Mellon, 1988)

In 1990, Mellon published the definitive work about the application of Naturalistic Inquiry to Library Science, appropriately titled *Naturalistic Inquiry for Library Science* (Mellon, 1990).

Of the various manifestations of non-use of information, Mellon's work describes most frequently the defense mechanism of "avoidance of the unknown" and its resultant affect, anxiety. Because defense mechanisms, in order to do their job, must by definition remain invisible to the person using them, Mellon is correct in emphasizing the importance of treating this affect through intervention by the librarian. Paradoxically, her suggested treatment method is bibliographic instruction, and her suggesting that anxiety must be allayed before instruction can begin leaves the practitioner in somewhat of a quandary as to where to begin.

Summary of non-use of information in the study of the information behavior of the three

Because users (and not systems) display affect, the "user turn" in information science required the study of affect where it had not been studied, before. This change in focus required methodologies beyond the then-prevalent quantitative methodologies. Chatman stepped in with ethnographic methodology. Kuhlthau created her three-legged socio-cognitive approach. Mellon employed Naturalistic Inquiry and Grounded Theory (the two have substantial differences (Glaser, 2004)). Between them, these three information scientists materially contributed to the "user turn," specifically, to the literature discussing the role of affect in library (and information) use and non-use.

A number of manifestations of non-use of information appear in the works of Chatman, Kuhlthau, and Mellon. Chatman implied the most:

- lack of threshold knowledge
- authoritarian control
- a hint of anti-intellectualism
- avoidance of real information
- mitigation of negative affect through filtering
- perceived cost exceeds perceived benefit
- avoidance of outside information
- Wurman's resignation
- Simon's satisficing
- avoidance of apperception or irrelevance or triviality of information.

Kuhlthau implied three:

- perceived cost exceeds perceived benefit
- avoidance of the unknown
- avoidance of overload.

Mellon stressed one:

- avoidance of the unknown.

Conclusion: understanding of information behavior via non-use of information

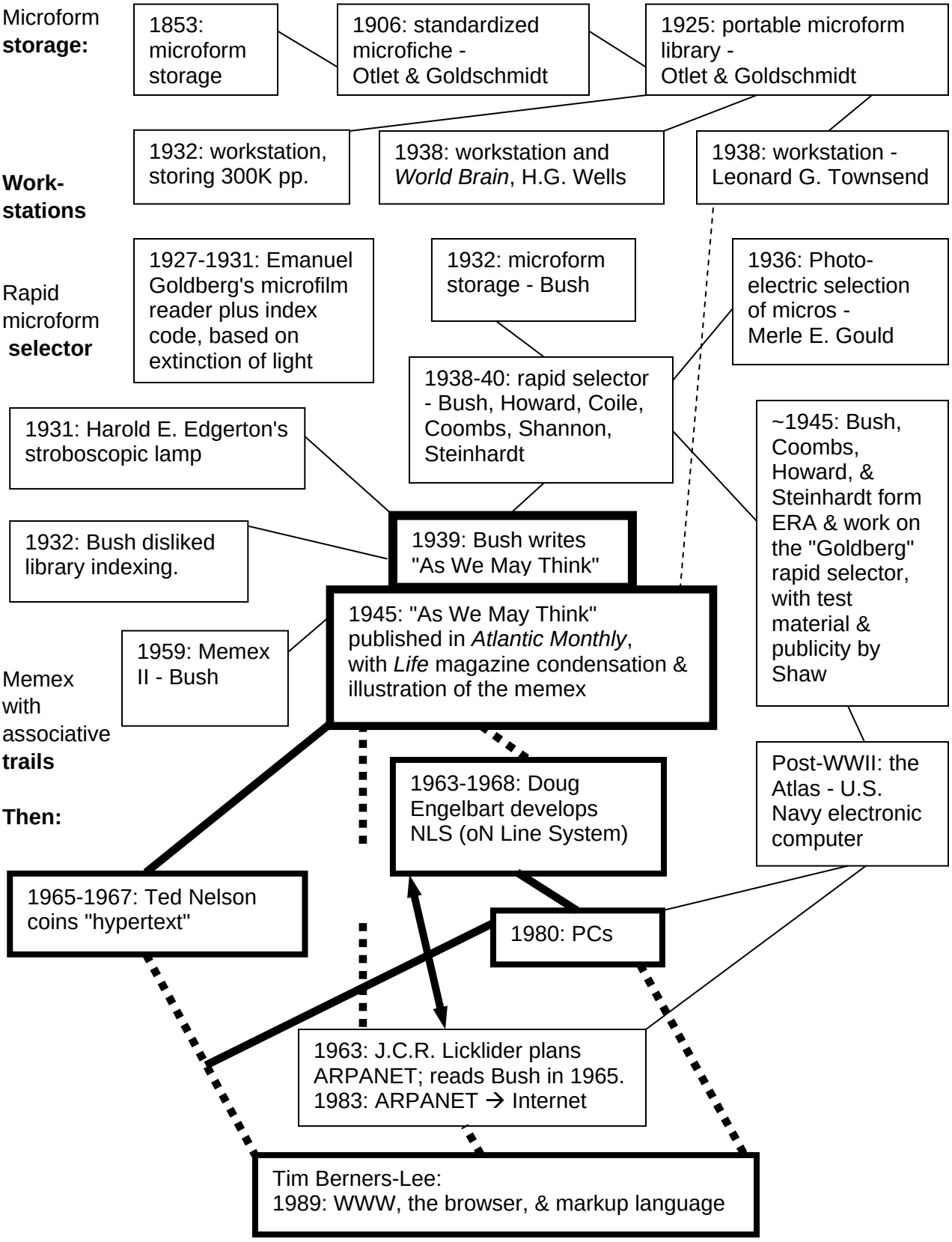
Although Chatman, Kuhlthau, and Mellon incorporated affect into their studies, they tagged it onto existing information science theories and practices. "Non-use of information" incorporates affect into its basic structure. Perhaps that is why this analysis of the works of Chatman, Kuhlthau, and Mellon through "non-use of information" revealed anomalies.

These anomalies should receive further scrutiny. Specifically, the shift in Chatman's work from volitional to non-volitional manifestations of non-use of information might be a valid phenomenon or it might imply a shift in researcher attitudes and bias. Second, through a theory

of non-use of information, the everlasting and adaptable "process" of Kuhlthau might be extended beyond the initiation stage to the stage at which the user does *not* initiate a search. Third, the paradox of how to implement Mellon's suggestion to "eliminate anxiety *before* instructing" might be resolved by applying other mechanisms of non-use of information, other mechanisms that employ affect.

Obviously, at this stage of research I do not have the answers. I do, however, feel that the questions are worth pursuing.

APPENDIX 1: A mapping of influences of AWMT on information science and technology



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