Research Paper Psychology

Learned Affective Norms: Affective and Cognitive Factors InWeb SearchBehavior Relating to Optimism, Self-Efficacy, Locus of Control, Affectivity, Loyalty

Dr. Leon James | Professor, Department of Psychology University of Hawaii

ABSTRACT

This research explores the dynamic interaction between affective norms and cognitive habits in Web based information search behavior longitudinally self-monitored over several weeks. Learned affective norms are motivations people have regarding initiation of information seeking, its direction, and its cessation. Content analyses of searchers' comments explore the relationship between affective norms and cognitive habits of Web searchers. Sample analyses are given of cognitive justifications given by searchers before, during, and after searching. Learned affective norms influence searchers' mood, optimism, locus of control, expected difficulty, uncertainty, time pressure, coping skills, satisfaction, and affectivity.

KEYWORDS Information Searching, Information behavior, Web, Content analysis, Affective norms, Cognitive habits, Optimism

1 Introduction

This research explores the dynamic interaction between affective normsand cognitive habits in information behavior. Prior research on the affective-cognitive interaction in information seeking behavior with college students indicates that search success and efficiency is higher when the searcher maintains a positive expectation about search outcome and one's own search skills (Nahl, 1996, 1998; Nahl and Harada, 1996; Nahl and James, 1996). This methodology relies on the normal literacy activity of being able to make a self-report of one's thoughts and feelings in a given situation, and in this instance, of their expectations about a search, whether it will be easy or difficult, take long or not, and also, why they think so (Nahl, 1997; Eastin and LaRose, 2000). The data presented in this article use content analysis of comments that searchers typed out in a document while searching with a Web browser.

The expression "learned affective norms" (LANs) is introduced and explored in its relation to associated cognitive habits. It was shown previously (Nahl, 2007a) that affective and cognitive interactions form the basis of establishing and maintaining normal activities in online socializing and task teams. Further, the members of a task group working together online adjust the character of their affective-cognitive interactions to be consistent with each other, so that no one in the group is seen as 'standing out' or doing something outside the expectations of what is defined as normal in the practices of that group (Nahl, 2007). There is therefore a process going on of mutual adaptation and conformity to expected limits of behavior and intervention. Expectations with conformity limits of normalcy are often called norms. This article discusses the dynamic interaction between affective norms and the cognitive habits that are associated with them in the case of Web searchers.

In general life situations, affective norms are characteristic motives people need in order to generate cognitive solutions to problems, and then to execute or perform them. For example, a characteristic affective norm in many daily situations is the common sense rule about how long things should take. This is conditioned by personal experience as well as community expectations. With few exceptions, waiting in a line should not take more than a few minutes. When this affective norm is broken, frustration increases and motives change. A new goal now takes hold, as shown by external behavior—leaving the line and doing something else. Or else, making a phone call, complaining, talking to the others in the line, etc. Every activity has associated with it a number of affective norms that determine goal-setting and new behavior. Another example is topicalization behavior in talk. We discuss particular topics within specific affective limits—what is permissible with one person is off limits to another person.

In information behavior, affective norms are motivations people have regarding initiation of information seeking, its direction, and its cessation (Nahl, 2005a). For example, people have specific affective norms regarding how long it should take for a particular Web page to load. There are personal and sub-cultural variations or limits. People extend their limit for popular sites at certain times of known or expected high demand. Another example is the affective norm people have regarding returned hits to a query with electronic databases—sometimes there are "too many" so that the query is reformulated before looking at any of the returns. The feeling of "too many" or "not enough" is an affective norm. Another common example is the affective norm of how long a search activity or session should take—if it takes longer, frustration and dissatisfaction start and can intensify until they put an end to the information behavior.

Another common affective norm with searchers is the content or relevance of the information to be expected. Certain sources of information are evaluated as more consistent with one's own attitudes. When a contrary attitude is found from that source the affective norm of information acceptance is broken. The result is a change in goal-directed behavior. New cognitive activity is generated to help resolve the affective imbalance or conflict. There are external behavioral consequences riding on the outcome of the problem solving—ignore the conflict and remain on the page, back out, send email, come back some other time, never come back, etc.

The present approach is consistent with the traditional principle in behavior theory that all learning and task performance must be motivated, and if there is insufficient motivation, no learning or performance can occur (Fishbein and Ajzen, 1975). More specifically, this investigation explores the conditional relationship between affective norms and cognitive habits of Web searchers. The monitoring of affective norms is based on the traditional method of evaluative ratings given by people about their current affective state. Cognitive processing accompanying each affective norm is supplied by the individual in a comment immediately after giving the numerical rating (see examples below).

2 Literature Review

Searchers make a series of cognitive decisions and sensorimotor actions, moment by moment as the search task proceeds. Learned affective norms(LANs) provide the adequate motivation and persistence required for proceeding with the task and for valuing goal attainment, that is, willing to exert effort and not quitting. In accordance with the traditionalbehavioral ap-

proach, it is assumed in this research that LANs exert control over the direction and duration of every cognitive process required for task performance.

For example, the decision to avoid alternative A and to select B, is under the control of learned affective norms,as indicated by evaluational expressions such as"*I don't like things like A*" or "*A is not as good as B, but I can't tell you why. It just is*." or "*I don't feel like going on. It just doesn't feel right*." etc. There may or may not be a conscious cognitive justificationthat a searcher can offer for avoiding A. The affective operation of avoidance may be based on personal or social, rather than logical considerationsaboutthe consequences of selecting A. Personal and social categories of affective norms supersede cognitive considerations, as expressed in people's statements: "*I know A is a better way but I've gotten used to B so it's easier just to stick with it*" or, "*People told me A is pretty easy to use but I'm not very good at things like that, so I don't know.*" Or, "*I feel that this task will not take too long because it is not for my bibliography so I am not as concerned about it, which means that I do not have to be picky about what I find.*"

These attributional expressions are actual things people said while searching. They show that affective norms of approach-avoidance can override cognitive choices in the searcher's sequence of actions. This super-ordinate relationship of the affective over the cognitive (Nahl, 2007b; Simon,1967; Zajonc, 1984; Fishbein and Ajzen, 1975)is especially noticeable in one crucial area of information behavior – the intention to quit or not to quit some ongoing activity. This affective norm operates at all levels of cognitive processing. Globally, this LAN determines the length and effort of a search session, whether it is abandoned in a few minutes or prolonged.

For example, one subject explained at the start of a search session: "*I'm tired and want to take a nap soon*." This subject quit after30 minutes. Another subject explained: "*My interest for today's topic is exceptional. I really look forward to finding something about it.*" and went on for 60 minutes. Another explained: "*Since I didn't find anything the last time, I have to be extra persistent*." This individual went on for 180 minutes. It is clear that "quitting time" in search behavior is determined by the complex of LANs that operate in the motivational system. This principle also applies to less global affective issues, such as how long a particular cognitive strategy will be pursued vs. modified or interrupted. Here too, a complex of sub-LANs interact to determine the quitting time for any particular search strategy. "Sub-LANs" designate a sub-category of learned affective norms.

An example of a sub-LAN is the motive that determines the decision to scroll down a Web page or to back out. This decision may not be based on cognitive considerations such as recognizing that the content is not relevant and deciding to back out. It may be based on situationallyactivatedLANs that influencechoice making. For instance, under certain conditions, there is a tendency to consider scrolling as effortful or tedious, thus unpleasant to some extent. Hence for the scrolling behavior to go on, second by second while inspecting a list, the searcher must continually overcome the negative affective norm with which scrolling is associated. In other words, the behavior of scrolling continues as long as it is controlled by the sub-LAN of "Keep Postponing Quitting" or "Do Not Quit Yet."

Note that scrolling down a long list of search results or a directory, is associated with a negative affective norm ("*This is endless. When can I stop*..."), while on the other hand, scrolling down a visual object such as a large photograph or map, has a positive affective norm attached to it "*Oh, how interesting. What comes next*..."). The sensorimotor scrolling behavior of the hand and eyes can be motivated either by a negative or a positive affective norm. For instance: (a) "*Oh, I got a lot of hits on this. I'm lucky today*." vs. (b) "*Oh, so many hits to go through. I've got to specify my topic better*." All cognitive facts derive their importance and relevance from their associated affective norms. This research assumes that every cognitive choice is directed by an affective norm that sets the expected goal. All goals are defined in terms of the individual's affective states or motives. This applies at all levels of goals and sub-goals of a task. Modifying the affective state by removing the motive also removes the goal, and this act interrupts or inhibits the cognitive decision-making process. Some other affective goal then takes control of the cognitive processing which continues in a new direction.

3 Methodology

In theory, a complex of global LANs with their specific sub-LANs are constantly operational during information behavior. As information managers, the more we know about the hierarchy of LANs that users typically have in an information setting, the better we can adjust the technical and social environment of information consumers. This research investigates the usefulness of one method for monitoringconcurrent affective norms of users in relation to their cognitive explanations or "accounts". The method has been called "accounted ratings" (Nahl, 2007b) and consists of items on a questionnaire form that searchers are requested to fill out during thesearch session (see Appendix below). For instance:

12) How motivated are you to keep on trying today until you succeed?

Type a number here: _____

1 2 3 4 5 6 7 8 9 10

slightly motivated very highly motivated Please give in an explanation for your answer: _____

One subject picked 2 and wrote: "*I don't really have the motivation to keep on going until I succeed because for one thing, after sitting in front of a computer screen for too long my eyes hurt, then my head hurts. And I also have other things to do that I consider more entertaining and self fulfilling.*" The session lasted 30 minutes before the person decided to quit. The affective norm of "sitting in front of a computer screen for too long" is set by personal and cultural limits.

Another subject picked 10 and wrote: "*Unless I fall asleep, I will continue to try and find relevant articles.*" This session lasted 180 minutes. Every searcher has a learned affective norm installed at the start of the task that will keep postponing quitting—until the affective norm reaches its limit and fails, at which point the search session ends. The "accounted rating" method has the advantage of being concurrent rather than retrospective from memory (Ericson and Simon, 1993). All affective monitoring reports in searching need be *concurrent* measures for obtaining greater accuracy and specificity of detail than what is the case with retrospective reports that rely on long term memory. The intensity of the rating given by the user provides an index of the motivational intensity of the affect or,what is called "affectivity". The first individual mentioned gave a very weak affectivity self-rating of 2, while the second person gave a very intense affectivity rating of 10. These two online searchers were operating under different global motivational norms for postponing quitting – 30 vs. 180 minutes.

The explanation that is provided by the user in the accounted rating is a cognitive account that the searcher formulates as a justification for the affectivity felt and rated. The less motivated searcher who quit after 30 minutesexplainedthe affectivity level of 2in terms of"*being tired, uninterested, and busy*". The more motivated searcher who quit after 180 minutes explained the affectivity level of 10 in terms of "*Don't quit till you drop*" or "*Keep going no matter what*.")The two individuals in this situation were operating with different sub-LANs regarding the affect or motive of task persistence. Since learned affective norms are culturally acquired through socialization and enculturation, the population of searchers will

overlap in terms of the typology of LANs that are operational in a particular search situation. This research uses a longitudinal approach that can uncover the extent to which searchers vary in LAN style over time, by inspecting the range of accounted ratings in cumulative search sessions for the same searcher. Students enrolled in a class were trying to improve their online search skills and practiced for 10 weeks in a row, one search session per week to be done on their own time and choosing.

The affective intensity of the motivation to postpone quittingalways operates on a particular cognitive sub-behavior, which insures that anefficient strategy can be pursued long enough to yield success.Typically, a search taskis composed of a sequence of sub-goals, each requiring its own affective norm of persistence in order to allow it to complete itself. But in novel search situations LANs may not be operative consistently, and conflicting sub-categories of learned affective norms may interfere with one another. Searchers in unfamiliar situations may not have in place an efficient inventory of LANs to direct their decision-making behavior moment by moment. This can be a source of information anxiety and uncertainty (Nahl, 2004).

With practice and some success, users have the opportunity to acquire new learned affective norms that are specifically appropriate to a particular information situation. The newly acquired affective norms allow them to direct and organize the unfamiliar cognitive decision-making sequence. Eventually the learned information behavior becomes a cognitive "habit" that appears to run itself off spontaneously and does not need to be rehearsed with awareness. What allows the new cognitive habit to run itself off spontaneously is the hierarchy of affective norms that is now in place at the end of the practice phase.The same LAN hierarchy may be applied by users todifferent search tasks at different times, so that it becomes a signature oftheir personality and information literacy style.

College studentswere encouraged to improve their online search skills by practicingone weekly search task for several weeks. They discussed their self-monitoring findings in their online forum discussions. While practicing their weekly Web searches, they kept track of their affective and cognitive behaviors during thesearch session, entering their feelings and thoughts in a document that was kept open along with the browser. Searchers kept track of three items: (1)comments that were enteredat the start the session; (2) comments that were typed during the session, and (3)comments that were typed at the end of the session or at quitting time. This approach was based on a form used by Nahl (2003, 2004).

4 Findings

4.1 Cognitive Justifications For How Long It Should Take

The 42individualskept track of their 10 weekly search sessions, but some students did not complete their ten weeks. In Table 1 below ratings were logged for Question 6that was to be filled out just before the start of searching for each search task. The answer to this question provides information regarding the searcher's initial expectations of how long this particular search should normally take. The questions are reproduced in the Appendix below.

Table 1 shows an analysis of the accounted ratings for that question. The explanations given by searchers are grouped by *category of justification*, as shown in all caps for each rating. The cognitive categories are arranged in order of the affective intensity of the associated rating. For instance the first category listedgives the cognitive justification for why the person thinks that the session should take much longer than usual (mean of 8). The reason for this expectation in this case is the belief that a lot of information is available on the search topic.

There are variations in affective intensity withineach cognitive category. When the categories justify the expectation of a longer session the mean rating is above 5. When a shorter session is expected, the mean rating is under 5. This shows the face validity between the intensity of the affective ratings in relation to their cognitive justification despite some individual variability of the ratings. The wording of the explanation makes clear whether the person is expecting a shorter or a longer session.

Table 1
Cognitive Justifications For How Long the Session Should Take

6) If you compare this task to other search tasks you've done, how long should it take? 1 2 3 4 5 6 7 8 9 10 much less than others much more than others Please type in an explanation for your answer:	
Affective Rating	Cognitive accounts by searchers giving that affective rating
8	EXPECTING A LOT OF INFORMATION ON THIS TOPIC (expect session to take longer) "*There is a lot more information and research on this topic than the previous ones. There are more articles to read through and select from.*" Or, "*It may take a little longer to find results because there may be a lot of information to look through*."
8	EXPECTING DIFFICULTY OR HAVING SELF-DOUBTS (expect session to take longer) "*It's been taking a pretty long time to do my weekly research ever since we started the forum discussions. I don't know if I am good at this kind of task*." Or, "*Searching for articles that cover two topics may not be easy*." Or, "When you haven't found the right combination of search engine and key words the search will take a long time." Or, "This is not going to be fun. I have a lot I have to accomplish." Or, "This task requires a lot of time." Or, "In order to find at least 5 accurate articles pertaining to my other research topic, spirituality, I would allot myself 2 to 3 hours." Or, "Because I just got out of work and I'm tired. It is harder for me to focus when I tired, hence the longer the time will be to complete this task."
7	RESTRICTING FOCUS TO MORE DETAILED INFORMATION (expect session to take longer) "It may take a little longer because I am looking for a sub topic under my main topic." Or, "I think that this would take a little longer than usual because I'm looking for something very specific. I think it's going to take time to read through the articles to see if it is something that I want to write about."
7	STARTING A NEW TOPIC. (expect session to take longer) "Since I am not just looking up the same research topic I have been for about three weeks now, I am thinking it will take a little more time to research a new topic." Or, "Because I haven't used this topic before"
7	IT BEING THE FIRST SEARCH (expect session to take longer) "I think it will take longer because this is one of my first searches, I am entering the search with very broad expectations." Or, "Longer because this is the first search session and I do not have a clue on what I am looking for even though I have a topic."

5	SIMILARITY TO PREVIOUS TASKS OR TOPICS (expect average length session) "I think that it will take the same amount of time because I know where more information is located." Or, "It just seems like it should be the same." Or, "I don't know why it would take any longer to find info about this topic." Or, "Since I know which topic I am going to use. So it shouldn't take long." Or, "Based on the recent searches that I have done, I think that it should be about the same in terms of the time."
5	IT BEING THE FIRST SEARCH IN THE SERIES (expect session to take shorter) "I predict that it will be fast because this is my first search." Or, "This is my first time with this new topic so it should take less time." Or, "Not long since I just want to find a bit of information to use for my weekly posting."
4	EXPECTING A LOT OF INFORMATION ON THIS TOPIC (expect session to take shorter) "I think that it may take a little shorter than other searches that I have done because there should be a lot of information on this topic on the web."
4	RESTRICTING AMOUNT OF INFORMATION WANTED. (expect session to take shorter) "I just want to find a bit of information to use for my weekly posting." Or, "I just want to find a bit of information to use for my weekly posting."
4	EXPECTING VERY LITTLE INFORMATION ON THIS TOPIC (expect session to take shorter) "It may take less time because I don't expect to get a lot of results returned." Or, "It may take a little less time because there will be less results to look through."
4	CUMULATIVE EXPERIENCE (expect session to take shorter) "I am more certain that I will be done faster since I have been researching this information for some time now and I can recognize what works and does not work easily."
3	SIMILARITY TO PREVIOUS TASKS OR TOPICS (expect session to take shorter) "Since I am looking for the same information, it shouldn't take long." Or, "This task should take less time than others. I will be able to find anything as usual." Or, "I think this search will end up taking about the same amount of time as my other searches." Or, "Not much since I know exactly what I want to find."

It is interesting to discover that the same cognitive justification is sometimes made for either expecting a longer session or a shorter session, showing their conflictual nature. To see the comparisonsmore easilyTable 1 is compacted and shown without the examples.

Table 2
More Compact Version of Table 1

Means	Cognitive Accounts	expect session to take
8	EXPECTING A LOT OF INFORMATION ON THIS TOPIC	longer
7	EXPECTING DIFFICULTY OR HAVING SELF-DOUBTS	longer
7	RESTRICTING FOCUS TO MORE DETAILED INFORMATION	longer
7	STARTING A NEW TOPIC.	longer
7	IT BEING THE FIRST SEARCH IN THE SERIES	longer
5	SIMILARITY TO PREVIOUS TASKS OR TOPICS	average length
5	IT BEING THE FIRST SEARCH	shorter
4	EXPECTING A LOT OF INFORMATION ON THIS TOPIC	shorter
4	RESTRICTING AMOUNT OF INFORMATION WANTED.	shorter
4	EXPECTING VERY LITTLE INFORMATION ON THIS TOPIC	shorter
4	CUMULATIVE EXPERIENCE	shorter
3	SIMILARITY TO PREVIOUS TASKS OR TOPICS	shorter

Under some conditions searchers predict a longer session (8) when they expect a lot of information to sift through, but under other conditions they predict a shorter session (4). The difference depends on the overall information need. When the searcher's information need is perceived as general or non-specific ("*anything will* do"), then expecting a lot of information on the topic promises a shorter session. But when the information need is specific, expecting a lot of information on it means having to sift through more material to find what's wanted, and so the expectation is for a longer session.

There is therefore a dynamic interaction between LANs at different levels of specificity or applicability to the situation. Someof the learned affective norms apply to non-specific information needs such as "*the quicker I can get this done, the better*." Others are sub-LANs that have to be made to fit into the overall operation, creating conditional LANs, as for example, "*I want to get this search task done quickly, but I also need to follow the instructions for this topic, and if there is a lot of information I have to sift through, this session may take a lot longer*."

Characteristic learned affective norms for expecting longer search sessions include

- expecting a lot of information on this topic
- expecting difficulty or having self-doubts
- restricting focus to more detailed information
- starting a new topic.
- it being the first search

Characteristic LANs for expecting shorter search sessions include

- it being the first search in the series
- expecting a lot of information on this topic
- restricting amount of information wanted.
- expecting very little information on this topic
- cumulative experience
- similarity to previous tasks or topics

The condition of being the first search in the ten weeks is associated with ambivalent LANs—it either leads to the expectation of a longer search session (7) or shorter (5), which is right at the midpoint of the affectivity scale. But the condition of being the first search on a new topic in a series of topicsleads to the expectation of longer sessions (7). For comparable reasons the condition of "similarity to previous topics" leads to the expectation of a much shorter session (3). People also have LANs regarding the expectation of shorter sessions when they feel more experienced due to cumulative searches (4), and also when they decide to restrict the amount of information wanted (4).

4.2 LANs of Optimism

Prior research with students under similar conditions (Nahl, 2005b, 2004) indicates that self-efficacy perceptions are powerful learned affective norms that influence the motivational dynamics of several interrelated factors, including mood, optimism, locus of control, expected difficulty, and urgency (Bandura, 1997; Rotter, 1990; Seligman, 1998). The searcher's feeling of optimism at the start of a search task may take several forms that vary in goal function and assessment. For instance, to the question "How sure are you that you will succeed in this task?" filled out at the start of the search, the

same searcher may answer differently for different sessions:

Table 3
Justifying Optimism (searcher 1)

9) How sure are you that you will succeed in this task? 1 2 3 4 5 6 7 8 9 10 doubtful almost certain Please type in an explanation for your answer:	
AFFECTIVE RATING	Cognitive Account for Optimism--Pessimism (One Searcher)
4	"I am a bit nervous about this particular search. I really do not have a clue as to how much information is available in the scientific world that pertains to rage."
5	"I have faith that at least one person has created a site to help individuals cope with their pets' illnesses."
10	"I am very confident that the Internet has information pertaining to at least one form of spirituality."

The searcher in Table 3 shows a range of optimism from 4 to 10. When looking on the Web for specific information (e.g., What is the scientific definition of "rage"), this searcher is somewhat doubtful of success (4), reflecting onsome nervousness and uncertainty.But when expecting a lot of information on a general topic (e.g., "spirituality"), the optimism reaches near certainty of success (10).

Table 4
Justifying Optimism (searcher2)

9) How sure are you that you will succeed in this task? 1 2 3 4 5 6 7 8 9 10 doubtful almost certain Please type in an explanation for your answer:	
AFFECTIVE RATING	Cognitive Account for Optimism--Pessimism (Student 2)
5	"I am not sure if I will succeed in this task. I realized that research for a specific topic needs some skills, but actually I do not have them."
7	"EBSCO database has lots of information. I will be able to find anything."

The searcher in Table 4 feels more optimistic (7) when expecting a lot of information in a familiar search environment, and less optimistic (5) when being self-doubting. The searcher in Table 5 is pessimistic (3) due to prior lack of success,but very optimistic (10) when she gives herself a pep talk.

Table 5
Justifying Optimism (searcher 3)

9) How sure are you that you will succeed in this task? 1 2 3 4 5 6 7 8 9 10 doubtful almost certain Please type in an explanation for your answer:	
RATING	Cognitive Account for Optimism--Pessimism (Student 3)
3	"I have been having such a hard time so far that to find something would be a real miracle."
10	"I have to try and think optimistically."

Table 6 summarizes the distribution of ratings for Question 9 on how sure they are that they will succeed in the task for each of the ten sessions. About half of the students (43 percent) show a small range of longitudinal variation across the sessions (0-2). Their expectation of success are similar across the 10 weekly sessions. The other half show greater variation across the sessions – 38 percent varying moderately (3-4 range) and 19 percent varying considerably across the sessions (5-7 range). The modal rating for the group as a whole was a 9 or a 10. The mean was 8.7 (sd=1.6) indicating a generally high self-assurance of success for these types of search tasks.

Table 6
Longitudinal Variation in Optimism

RANGE OF AFFECTIVE RATING	N	Percent	Searchers' Consistency Across Time For Optimism-Pessimism
0-2	18	43	Expect same success across time
3-4	16	38	Expect moderately different success across time
5-7	8	19	Expect different success across time

Table 7 shows a selection of concurrent accounts given to the self-efficacy affectivity ratings. The cognitive justifications are labeled high or low depending on whether the LAN contributes or detracts from performance outcome.

Table 7
Varieties of LANs of Optimismand Their Cognitive Justification

9) How sure are you that you will succeed in this task? 1 2 3 4 5 6 7 8 9 10 doubtful almost certain Please type in an explanation for your answer:			
RATING	CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANsLEARNED AFFECTIVE NORMS	COGNITIVE JUSTIFICATION
3	I am very certain that I will be able to complete my task because I will not stop until it is finished.	feeling self-reliant	determined not to quit before success
4	I am a bit nervous about this particular search. I really do not have a clue as to how much information is available in the scientific world that pertains to rage.	feeling apprehensive	there will not be information on the topic
4	Simply because the Internet provides such a wealth of information, I have no doubts that I will be able to find information pertaining to my topic. It is not that specific.	feeling optimistic	there will be a lot of information on the topic

4	Science and spirituality don't seem to be a likely paring. Maybe I will have a hard time finding even one journal article on the subject, but I am going to try.	feeling pessimistic	there will not be information on the topic
5	I'm not sure the technique I use would help. I'm not sure about my ability of searching on the Internet.	feeling self-doubt	doesn't know enough about search techniques
5	I am not sure what to expect. I have a pre-idea about what I will encounter, but this is new to me. I have never used the Internet to track down research articles.	feeling uncertain	inexperience in searching
5	I still have some doubt about my searching skills at the Internet, although I have been doing it for a long time.	feeling self-doubt	low assessment of skills despite some experience
5	I am doubtful since I failed to search for the same topic once.	feeling self-doubt	prior experience of failure
5	I usually find something interesting, but not always useful.	feeling conflictual	results may not be relevant
6	I don't know about this one just because I haven't heard a whole lot about it. I will just keep trying different key words and see what works best.	feeling optimistic	determined not to quit before success
6	I'm quite certain that I will find something because I usually do but like I said it's late and I'm already cranky.	feeling optimistic	prior experience of success
6	I expect there are few resources for the topic.	feeling pessimistic	there will not be information on the topic
6	I am not sure if I will succeed in this task because I have no specific skills in research.	feeling uncertain	inexperience in searching
7	The internet has so much information, I'm sure I'll find something that will be useful	feeling optimistic	there will be a lot of information on the topic
7	So far I found everything that I needed so far. I am certain that I am able to succeed in this task	feeling optimistic	prior experience of success
7	I am trying to remain optimistic about this search however since I have not completed a search of this type before I am not sure how easy or difficult it will be.	feeling uncertain	inexperience in searching
8	I heard others in class say that there are a lot of information that deals with pets and dying.	feeling optimistic	there will be a lot of information on the topic
8	I do think there is a good chance I will get something useful. The web has yet to fail me in providing useful info, so I don't see any reason why it would be different now.	feeling optimistic	prior experience of success
8	I am a little unsure because I have made my topic a little less broad than it was before.	feeling conflictual	topic specificity makes search more difficult
8	I feel confident that I'm going to find some information on this topic. The internet has a lot of articles, but I think it's just going to take some time.	feeling optimistic	there will be a lot of information on the topic
8	I'm pretty good at searching and finding the things that I need.	feeling self-reliant	prior experience of success
9	The topic of workplace rage should not be hard to find online. I am sure I will find something on it.	feeling optimistic	there will be a lot of information on the topic
9	I am very confident because my other searches have gone well so far.	feeling optimistic	prior experience of success
9	I am pretty sure that I will find something in this time period I have designated for this task because I am feeling very motivated to get it done.	feeling optimistic	determined not to quit before success
10	I search using search engines a lot	feeling self-reliant	prior experience of success
10	I am very certain that I will be able to complete my task because I will not stop until it is finished.	feeling optimistic	determined not to quit before success

The main LANs of optimism identified in this analysis are:

- feeling optimistic
- feeling self-confident
- feeling self reliant

and

- feeling pessimistic
- feeling apprehensive
- feeling self-doubt

The main cognitive justifications are:

- determined not to quit before success
- there will be a lot of information on the topic
- prior experience of success

and

- there will not be information on the topic
- doesn't know enough about search techniques
- prior experience of failure

Once again the patterns in Table 6 show that it is not safe to rely solely on the affectivity ratings since the same rating can mean optimism, pessimism, or uncertainty. For instance:

6	I'm quite certain that I will find something because I usually do but like I said it's late and I'm already cranky.	feeling optimistic	prior experience of success
6	I expect there are few resources for the topic.	feeling pessimistic	there will not be information on the topic
6	I am not sure if I will succeed in this task because I have no specific skills in research.	feeling uncertain	inexperience in searching

And also:

4	Simply because the Internet provides such a wealth of information, I have no doubts that I will be able to find information pertaining to my topic. It is not that specific.	feeling optimistic	there will be a lot of information on the topic
4	Science and spirituality don't seem to be a likely paring. Maybe I will have a hard time finding even one journal article on the subject, but I am going to try.	feeling pessimistic	there will not be information on the topic

The same justification may be given for different affectivity ratings, and the same affectivity rating may have a different cognitive justification. Nevertheless, these differences operate within

recognizable limits so that more extreme ratings of positive affect (7 or above) are strongly associated with LANs of optimism and self-reliance.

4.3 Tracking Longitudinal Patterns in Affectivity

Table 7
Longitudinal Pattern for Some Affective Ratings

	MEAN FOR WEEKLY SESSIONS (N=42 students)										Standard error, range
	1	2	3	4	5	6	7	8	9	10	
Expected Relative Length (Q6)	5.3	5.2	5.4	5.3	5.6	6.1	8.2	5.0	4.5	4.6	.31 to .55
Importance of Task (Q7)	7.6	7.8	7.8	8.0	8.3	8.6	8.2	8.0	7.3	7.5	.27 to .57
Distressed if nothing found (Q.8)	5.1	5.2	5.2	5.3	6.2	6.4	6.0	6.0	5.4	5.3	.43 to .64
How lucky are you (Q11)	7.8	7.9	7.3	7.8	7.6	8.0	7.8	7.6	7.4	7.7	.26 to .53
Expected Minutes for Session (Q5)	51	52	51	54	74	71	64	54	48	51	6.3 to 8.8

Table 7shows an overall consistency of searcher behavior over the ten weekly search sessions they scheduled for themselves. The standard error range shows that some sessions have their own scenario which is somewhat different from the rest. These are sensitive measures of affective operations that can pick up slight but improbable and significant changes in affectivity. There appears to be a stronger affectivity for sessions 5, 6, and 7. They expect these searches to take longer than the others (70 minutes. vs. 52; and for the rating: 6.6 vs.5.0). These sessions are felt to be more important (8.4 vs. 7.7) and lack of success would cause greater distress (6.2 vs. 5.4). There is a general face validity showing that the motivational dynamics in information behavior is integrated at both the general level of the affective environment (across sessions) as well as for local conditions (particular sessions).

It is assumed that the main reason for local variation of the affective environment in this study is the topic itself. Some topics appear more difficult to searchers and they expect more difficulty. Future research will need to explore such topical perceptions in information behavior. During each self-initiated weekly session, students made a choice of which of five topics to research that were specified for the searches. They had the option of doing three weekly searches for each topic in any order. The topics were specified as follows:

- How do people deal with sick pets or pets that get old and no longer function normally.
- What are the differences between men and women in how they handle relationships.
- What do people do while they are driving and what are the consequences. Examples include, but are not limited to: eating, talking on the phone, listening to music, partying, fighting, etc.
- How and when do people express rage in their normal daily settings. Examples include, but are not limited to: workplace, home, sports, games, crimes, portrayals on TV, novels, etc.
- What are the forms of spirituality in our society today? Examples include, but are not limited to: religions, lifestyles, disciplines, belief systems, etc., all relating themselves to spirituality or God.

4.4LANs of Self-Efficacy

Table 8 explores the interaction dynamics between affectivity (intensity of affective rating) and the consequences on the level of cognitive processing. The theory assumes that these two interact through the intermediary of the affective norm involved. For instance, as a measure of self-efficacy motivation, searchers were asked to rate themselves on how they feel about getting good at this type of search task (Question 10). The first entry in Table 8 is as follows:

4 LOW	I may get better at choosing what key words to put in the search box to help me out, but I think it really depends on the amount of information available.	SELF-DOUBT based on pessimism

This searcher(above) gave an affectivity rating of 4, indicating self-doubt about self-efficacy. The associated cognitive account is categorized as "self-doubt based on pessimism." This type of justification is labeled as a low level of cognitive processing or effort. By contrast, another student's entry is as follows:

9 HIGH	I feel that I am becoming better and better at searching on Google each time I do it.	SELF-EFFICACY based on practice and success

Here the affectivity rating is very high (9), indicating strong self-confidence in becoming competent. The LAN category assigned to the associated cognitive justification is "Self-efficacy based on practice and success." This is categorized as a high level cognitive processing or effort.

Exploring the other entries in Table 8shows that the same affective-cognitive habit association is used by various searchers, but with different consequences on expectation of success – from doubtful (1) to certain (10). For example:

6	I have confidence in myself, but there will always be doubts.	SELF-DOUBT based on caution
6	I think if I keep doing it, I can be pretty good at this kind of task, hopefully.	SELF-EFFICACY based on practice and success

Both students gave an affectivity rating of 6 yet have associated with it opposite cognitive processing effort. One student's cognitive account is "self-doubt based on caution," while the other is "self-efficacy based on practice and success."

Table 8

Relationship Between Affectivity, Learned Affective Norms,and Cognitive Level of Processing

10) How likely is it that you will become good at this type of task? 1 2 3 4 5 6 7 8 9 10 pretty doubtful almost certain Please type in an explanation for your answer			
AFFECTIVE RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS	ASSOCIATED LEVEL OF COGNITIVE BEHAVIOR
4	I may get better at choosing what key words to put in the search box to help me out, but I think it really depends on the amount of information available.	SELF-DOUBT based on pessimism	LOW
5	At this point, I doubt my ability according my previous experiences. However, as long the continuing searching experience, I think I would improve my ability.	SELF-DOUBT based on lack of success	LOW
6	I know I need to improve in becoming better at this type of task.	SELF-EFFICACY based on practice and success	HIGH
6	I don't think I will get "better" it really depends on what's out there.	SELF-DOUBT based on pessimism	LOW
6	I have confidence in myself, but there will always be doubts.	SELF-DOUBT based on caution	LOW
6	Don't know how good I'll become at the task, but I know that as I progress through this project I am becoming more and more familiar with the Internet. I expect that the more specific my goals are for a particular search, the more difficult it is going to be.	SELF-DOUBT based on anticipation of difficulty	LOW
6	I am not sure if I will become 'good' at looking for these materials. I do intend to find what I am looking for. I will have to wait and evaluate my progress on this issue.	SELF-DOUBT based on caution	LOW
7	I don't do this kind of searching that often.	SELF-DOUBT based on inexperience	LOW
7	I've been searching a lot for this class. I should be getting the hang of the Internet by now.	SELF-EFFICACY based on past experience and self-confidence	HIGH
7	Now, I do not have skills for searching for something specific. If I have more experience and learn skills, I will be better.	SELF-EFFICACY based on practice and success	HIGH
7	I will become good at this task because I will complete it.	SELF-EFFICACY based on determination	HIGH
8	I think I'm good at finding information on the internet because I've been doing it for a while now.	SELF-EFFICACY based on practice and success	HIGH
8	I don't know how well I am at surfing online, but it is nothing new to me so I have high hopes that I will become good at it.	SELF-EFFICACY based on past experience and self-confidence	HIGH
9	The more time and exposure I give to this task, the more efficient and knowledgeable I will be.	SELF-EFFICACY based on practice and success	HIGH
9	I am almost certain because each time I search, I learn how to find things a little easier.	SELF-EFFICACY based on past experience and self-confidence	HIGH
9	I feel that I am becoming better and better at searching on Google each time I do it.	SELF-EFFICACY based on practice and success	HIGH
10	I haven't failed yet.	SELF-EFFICACY based on practice and success	HIGH
10	I have had to do a lot of research using the computer. I feel comfortable using the computer and know how to research for topics.	SELF-EFFICACY based on pastexperience and self-confidence	HIGH
10	I know if I practice long and hard enough eventually I will be a great web searcher.	SELF-EFFICACY based on practice and success	HIGH

Table 8 also shows that certain LANs are associated with lower level cognitive behavior than others. In other words, leaned affective norms exert an effect on cognitive skill level. At the start of each weekly search session, searchers were asked "How likely is it that you will become good at this type of task?" Searchers answered using a scale of 1 ("pretty doubtful") to 10 ("almost certain"), and then typed an explanation for the rating. In Table 8 the answers are quoted in the column marked "Sample Concurrent Accounts." Each explanation or account of what the rating represented, is a representation or index of the affective and cognitive interaction dynamics that each searcher experiences and monitors in conscious awareness.

Each account indexes two elements in relation to the question or prompt: (1) the affective norm that motivates the rating or self-assessment, and (2) the cognitive justification given in the explanation . Table 8 categorizes each cognitive justification into "low" level and "high" level.Low-level cognitions justify negative LANs such as pessimism and self-doubt, while high-level cognitions are associated with positive LANs such as self-efficacy and optimism.

The patterns in Table 8indicate that self-efficacy and optimism LANs have stronger positive affectivity ratings and areassociated with high level cognitive processing operations. In contrast, LANs of negative affectivity or self-doubt, have generally weaker ratings and are associated with low level cognitive processing operations.

4.5Locus of Control LANs or Control Beliefs

Prior research has shown that an important affective norm in many circumstances is the feeling that we are in control of the situation. This has been discussed in the psychological literature under the topic of "locus of control" and under "control beliefs" (Rotter, 1990; Fishbein and Ajzen, 1975). Since this is a general affective norm we would expect that it is operating in information behavior as well. The expression "a searcher's control beliefs" echoes the synergistic operation of the affective and cognitive operations in information behavior. "Belief" refers to a cognitive operation involving knowledge facts in memory. But "control" refers to an affective operation involving goal motivation, which directs, selects, or controls a cognitive operation.

A searcher's control beliefs refer to the "locus" of control involving search results. When searchers are experienced with some search routine and environment, they tend to feel that they are in control of results. They attribute the outcome to their search capabilities or skills. The "locus of control" is located in their competence and performance. At other times searchers feel "control shy" and tend to attribute the outcome to other factors – luck, the search engine, the amount of information available, help from others, or a combination of reasons.

Searchers' control beliefs influence their information behavior in a number of ways. Under affective conditions of being control shy, searchers show more negative affectivity like frustration, dissatisfaction, and low self-efficacy motivation, which lead to maladaptive information behaviors that reduce the likelihood of positive outcomes (Nahl, 1997). On the other hand, when searchers are in a state of positive affectivity like optimism and high self-efficacy, they tend to attribute success to their own search skills. They perform more efficiently and experience a stronger sense of satisfaction and victory (Nahl,2005).

Table 9 presents a sample of answers to the following question about luck. It was filled out at the start of each weekly search session (the overall mean was 7.7).The accounted ratings show that searchers use two main categories of affective norms regarding their attribution of reasons for search success – luck vs. skill. Searchers who do not believe in luck as a significant factor attribute their success to skill from practice, to specificity of the query, and to the large amount of information available. Searchers who believe in luck feel that it nevertheless varies with day, topic, and resources used. Some searchers attribute all of the search success to luck.

Table 9

LANs Related to Control Beliefs

11) How much luck do you have in searching in comparison to other types of tasks? 1 2 3 4 5 6 7 8 9 10 I have bad luck I always find something useful Please type in anexplanation for your answer:		
RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS
2	I do not believe luck has to do with searching.	LUCK IS NOT INVOLVED other search factors are important
4	I normally get what I need eventually, even though it may take longer than other tasks to complete. I would say I am more persistent then lucky.	LUCK IS NOT INVOLVED other search factors are important
5	I am beginning to feel that I am not as lucky as before in searching for the things that I need	BAD LUCK feeling less lucky lately
5	I have luck in searching compared to other tasks.	GOOD LUCK in searching
5	Half and half because luck will come only if you give effort to it.	LUCK AND SKILLS mixed together
5	I do not really believe in luck. I suppose it is through sources or internet search engines that will guide in my results.	LUCK IS NOT INVOLVED other search factors are important
6	I feel the same as I have felt in the past that I do not believe it takes too much luck in finding information.	LUCK IS NOT INVOLVED other search factors are important
6	Sometimes I find really good information out of nowhere, so maybe I will get a little luck this time too.	GOOD LUCK in searching
6	It totally depends on the day. Luck in searching is much more unstable than luck in other types of tasks.	LUCK VARIES depends on the day
7	I have always had good luck and have gotten what I have needed.	GOOD LUCK in searching
7	With the proper key words, something good always comes up.	LUCK IS NOT INVOLVED other search factors are important
7	If I just stick to my task, I usually find something. I feel lucky today since I am looking up workplace rage.	LUCK AND SKILLS mixed together
8	I try to use reliable search engines, and usually bookmark useful links.	LUCK IS NOT INVOLVED other search factors are important
8	When it comes to searching on the internet, I normally have good fortune, that is luck is on my side, because I can always get something that is close to what I need.	GOOD LUCK in searching
8	I would like to think that it is skill and not luck, but I usually find what I need without any problems.	LUCK IS NOT INVOLVED other search factors are important
9	I think that I usually have pretty good luck when I search for something. There is so much information available on the internet that I almost always find something of use or at the very least of interest to me.	GOOD LUCK in searching
9	My luck has been good to me lately so I believe I will be lucky.	GOOD LUCK in searching
10	I have been lucky so far and I believe that I will be lucky again.	GOOD LUCK in searching
10	There's so much information available out there. It would be very unusual not to find anything.	LUCK IS NOT INVOLVED other search factors are important
10	I got to narrow my search down from the last session so hopefully I would have much luck finding something useful	LUCK AND SKILLS mixed together

When the affective ratings are related to the cognitive explanations it appears that the ambiguous wording of this question was interpreted in various ways by the respondents. There appears to be no logical relationship between the intensity of the affective rating and the content of the explanation, unlike the other questions considered above where the relationship is visible. Further research needs to be done to unravel what's going on.

4.6Coping Skills: The LAN of Postponing Quitting

Every cognitive sequence of decision-making in any information behavior faces sudden death if the affective norm for Postponing Quitting is lifted. The point of quitting for any cognitive operation is now, unless the cognitive sequence is kept connected to the goal hierarchy that exerts control over it. People learnaffective norms in task situations and use them to manage their goal-directed behavior. One of the cultural LANs known in our society is the affective norm against quitting something too soon. Searchers are constantly faced with the dilemma of when to quit some information behavior sequence that is unfamiliar or uncertain. Quitting an ongoing information behavior sequence allows the searcher time out for cognitive reappraisal of what's going on, and thismay be beneficial. On the other hand, quitting at a higher level in the goal hierarchy may or may not be beneficial depending on the motive for quitting and its level in the overall hierarchy of LANs that are in control of that behavior sequence.

Table 10 explores the coping strategies used by searchers for different affectivity levels, which indicate the strength of the overall goal motivation for the search session. The Table indicates that there are both supportive LANs and conflictual LANs operating in information behavior. Supportive LANs are various affective norms that the searcher subordinates to the main goal for the session, thus increasing the likelihood of success and satisfaction. Conflictual LANs are various affective norms that the searcher super-ordinates to the session's goal. These other super-ordinate goals interfere with the goal of the search task.

Table 10indicates that searchers are constantly faced with multiple affective norms operating simultaneously in the search situation. Quitting vs. Postponing Quitting depends on the searcher's skill in subordinating all other affective norms during the search session. Quitting behavior is associated with different cognitive operations than those involved in not quitting behavior. Not quitting is associated with coping styles that are success and mastery oriented. Quitting is associated with both coping and not coping. For instance, quitting due to fatigue or limited time and rescheduling, is a coping strategy that may yet lead to mastery and success, but quitting due to uninvolvement or limited goal, is a "not coping" mode that inhibits mastery and success.

The same person at different times or search conditions may use all the available affective norms described in this table, indicating that LANs related to information behavior are culturally acquired, shared, and maintained. Nevertheless, there may be preferred LANs which an individual maintains consistently across situations and time.

Table 10
LANs of Quitting vs. Not Quitting

12) How motivated are you to keep on trying today until you succeed?
1 2 3 4 5 6 7 8 9 10
slightly motivated very highly motivated
Please type in an explanation for your answer:

RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS
1	I frequently experience rage when working with my computer. Extreme frustration overcomes me. Knowing, however, that my search was left incomplete also adds to my stress level.	NOT COPING quitting due to excessive frustration
1	I am not totally motivated to find information right now. I have other classes to worry about at the moment.	NOT COPING quitting due to conflictual emotions
1	Very little motivation, I'm just hoping to find something to keep me going for just a little while, then maybe I can fall asleep.	COPING by postponing quitting
2	I am not in a situation that requires much expenditure of motivation because what I am doing is extra collection, in addition to what I already have.	COPING bylimiting goal
3	It is late at night. I just ended a 3 hours night class and I am tired. I want to perform this search and do a good job. I am not that motivated to stick it out, if I don't get results within half an hour.	COPING by postponing quitting
3	Not as motivated today because I have other things to worry about at this moment.	NOT COPING quitting due to conflictual emotions
3	I'm not that motivated to keep trying because I'm just not feeling up to it. I guess I have a lot of information, so if I find anything, it will be very minimal.	COPING by limiting goal
4	I am not totally motivated to find information today. I have a short amount of time at the moment, but I know that I have more time later, so I'll just see what comes up.	COPING by limiting goal
5	Gotta get the report finished.	COPING by postponing quitting
5	I'm tired now, but it is homework; I have to do my best.	COPING by supportive LANs
6	I am motivated, but my eyes are very heavy.	COPING by postponing quitting
6	Though I am getting a bit tired of using the Internet, I am quite motivated to finish these searches so I can participate in the forum discussions in a timely manner.	COPING by supportive LANs
7	The subject topic at hand is somewhat interesting to me and I would like to learn more about it.	COPING by supportive LANs

Table 10shows that coping has three main sub-components: (a) postponing quitting; (b) limiting the search goal; and (c) activating supportive LANs (e.g., doing well on the assignment). Not coping two main sub-components: (a) quitting due to excessive frustration during searching; (b) quitting due to conflictual emotions or competing goals.

Coping strategies are related to motivational intensity. Weaker affectivity ratings have more limited coping strategies such as postponing quitting for a few minutes or limiting the search goal. Stronger affectivity ratings are associated with coping strategies that activate supportive LANs such as doing well on assignments or personal interest in the topic.

4.7LANs of User Trust and Acceptance

Users develop positive affective norms as they cumulate experience and success. Negative LANs are acquired with failure caused by hardware or software problems. Every LAN has its cognitive justification. Positive LANs are associated with scenarios of what would happen without computers and search engines. Negative LANs are associated with scenarios of computers and search engines going wrong. Mixed LANs are associated with scenarios of computers and search engines functioning properly or not.

Table 11
LANs of System Acceptance and Loyalty

13) computers and search engines make it easy for people to find what they're looking for. 1 2 3 4 5 6 7 8 9 10 I strongly disagree I very much agree please type in an explanation for your answer:			
AFFECTIVE RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS	COGNITIVE BEHAVIOR--ATTRIBUTION
4	Computers have the potential of creating enormous headaches for its users. I have had the worse luck, specifically, with my computer screen freezing. This causes me a great deal of stress, for I have no other choice than to start my search over again.	negative LAN experiencing failure	problems with software
5	Yes, I feel search engines make it quite simple to find what they are looking for but, it also brings up a lot of other sites that are not useful to what you are looking for and makes the task even harder to sift through the rumble of sites.	mixed LAN conditional acceptance	depends on relevance of information
5	My computer has not been letting me get on the internet lately which makes my computer useless it also makes my search engines useless if I am not able to use them when I cannot get on the internet!	negative LAN experiencing failure	problems with online access
5	I suppose they help but if the search engine is junk how are you to know because that's the only place you can find your information.	mixed LAN conditional acceptance	depends on relevance of information
6	When I search for a specific topic, I eventually need to read the whole article or paper. If search engines show main idea or thesis, the task would be easier.	mixed LAN conditional acceptance	depends on quantity of relevant information
6	Dogpile should be a lot easier to me because now I have the experience in using it.	positive LAN experiencing success	selective and cumulative familiarity
6	While search engines are quite convenient, I believe they are in need of more advancement. It is extremely frustrating when results do not appear for particular searches. I have, in the past, found myself searching for something that I knew existed, but for whatever reason, my search results would never contain specifically what I wanted. Perhaps it is not the search engine, but my search techniques that are in need of improvement.	mixed LAN conditional acceptance	combination of search engine problems and inadequatesearch skills
7	I think that computers and search engine are very helpful as opposed to not having them at all. BTW, computers make the internet.	positive LAN experiencing success	usefulness and convenience
8	I agree that computers make it easier to look up research than the old way of looking up a book and then skimming it until you found something. This is a lot more useful it searches for you in minutes.	positive LAN experiencing success	usefulness and convenience
8	If the person knows how to correctly search for something effectively then it's easy	mixed LAN conditional acceptance	depends on having adequate search skills
8	There are good search engines yet search techniques play a role as well	positive LAN experiencing success	depends on having adequate search skills
8	I agree because it is much easier for me to search from my home than have to go to the library.	positive LAN experiencing success	usefulness and convenience
9	I suppose that search engines make it easier for people too search the web because it provides a place to go where information on any topic can be found.	positive LAN experiencing success	usefulness and convenience
10	Search engines help a lot because you type in a few words and there in front of you is all the info. in the world. It's like your own personal library.	positive LAN experiencing success	usefulness and convenience

Table 11 shows that there is a strong relationship between affectivity and LANs. Positive LANs of search engine acceptance occur mainly with affectivity ratings of 7 or above, as found earlier in previous tables. Low acceptance ratings and negative or mixed LANs are associated with prior unsuccessful experiences:

- quantity of information to sift through
- problems with online access
- unfamiliarity with software
- software problems with inadequate skills

Table 12 shows a sample of cognitive justifications for choosing a search engine. Google was the choice of most students in this group (N=42).

Table 12
Justifying Search Engine Loyalty

15a) Please list the databases and search engines you are using today and why.		
SEARCH ENGINE	SAMPLE REASONS GIVEN BY DIFFERENT SEARCHERS	COGNITIVE ATTRIBUTION
google.com	I have used this engine since it had given me good results in the past.	prior success
google.com	My friend mentioned that this was the search engine that she most often used. I had heard of it, but never used it personally.	friend recommended it
google.com	I always use it first.	loyalty and regular use
google.com	I like google, and a lot of other people recommend it.	loyalty and popularity
google.com	The best!	loyalty
yahoo.com	I chose yahoo because I wanted to rotate the search engines that I use.	strategy with multiple search engines
yahoo.com	It is very popular website, it must have many information in there.	popularity and reputation
msn.com	I trust it.	loyalty and trust
academic search premier/ seattletimes.com/	I tried to find something form scholarly databases./ Since I failed to find what I looked for on EBSCO database, then I tried to find something from online newspapers.	strategy with multiple search engines

Table 12 shows that the main reasons given for choosing a search engine include

- loyalty
- popularity
- trust
- regular use
- prior success with that search engine
- recommendation
- strategy with multiple search engines

4.8LANs of Expected Effort

Previous research under similar conditions (Nahl, 2004) showed that the motivational LAN of expected effort is associated with conditions of lower self-efficacy and mood. Students who expect a search task to take a lot of effort actually spend more time completing the search task.

Table 13
LANs of Expected Effort and their Cognitive Attribution

15) How much effort do you expect this task to take today? 1 2 3 4 5 6 7 8 9 10 not much a tremendous amount Please type in an explanation for your answer:			
AFFECTIVE RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS	COGNITIVE ATTRIBUTION
1	I know where it is already.	EXPECT MINIMAL EFFORT	knowing the location
2	I don't think there's that much effort as long as you put in the specific topic you are looking for. There is so much information.	EXPECT MINIMAL EFFORT	predicting quantity and availability of information
3	Not that much effort since I've done this topic before so I know what I am looking for.	EXPECT MINIMAL EFFORT	prior searching with same topic
4	I'll have to actually read articles to see if it's what I'm looking for so that will take some effort.	EXPECT SOME EFFORT	searching and reading combined
5	I don't expect to use a lot of effort because I did this search before and found a lot of hits.	EXPECT SOME EFFORT	prior success with this topic
6	I think it will take a little more effort than usual because I'm not very motivated to do homework today.	EXPECT MORE EFFORT	takes effort to compensate for low motivation to do task
7	I am a little tired.	EXPECT MORE EFFORT	takes effort to compensate for tiredness
8	Because it's my first one.	EXPECT MORE EFFORT	unfamiliarity with system or topic
9	I really want to read through the material and make sure it is relevant and useful to anyone who reads the posting.	EXPECT MORE EFFORT	searching and reading combined

The pattern of results in Table 13 indicate that expecting more effort relates to

- compensating for being tired or having low motivationto do a task
- unfamiliarity with the system or the topic
- having to do searching and reading combined

Expecting less effort relates to

- knowing the location of the information
- having prior success with this topic
- predicting that a lot of information is available on a topic

having done prior searching with the same topic

4.9LANs of Feeling Irritated and Anxious

Table 14 shows a sample of cognitive justifications searchers have for feeling irritated, and their associated affectivity rating.

Table 14
Learned Affective Norms of Irritation and their Cognitive Justifications

16) How irritated did you feel in today's search task? Type a number here: 1 2 3 4 5 6 7 8 9 10 no irritation extremely irritated Please type in an explanation for your answer:			
AFFECTIVE RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS OF IRRITATION	COGNITIVE ATTRIBUTION
1	I enjoyed my time online since it was on a break and I had a very productive time.	NONE	enjoyment and productivity
2	Immediately when I signed on, there was a link on my welcome page that directed me to an article by the Associated Press.	NONE	quick success
3	Because I was sleepy and wanted to call it quits for the day.	SOMEWHAT	being tired
4	When I went to the site for APA.org to find some journal articles, I was bothered that they made you pay to have access. That irritated me. Also I was getting commercial results, i.e., buy this book about relationships, or seminars about relationships.	SOMEWHAT	paying for access and ads
5	Even though I found exactly what I was looking for, I was a little disappointed because there were only a few journal articles on my topic.	SOMEWHAT	only a few results
6	I wanted to finish searching today so I would not have to worry about it though out the whole semester. No way, Jose! I could not find no article that was interesting enough.	QUITE A BIT	no relevant results
7	I felt slightly irritated because when I finally found something useful after reading through a lot of material the computer I was on would not print. Thankfully the librarian let me print from his computer.	QUITE A BIT	printing problems
8	I could not find anything on the APA journals, monitor articles nothing I am not too happy.	QUITE A BIT	no relevant results
9	I did get irritated because I am hot.	QUITE A BIT	being hot
10	I am really irritated right now with my task. It took a lot longer than I wanted to spend on the net today.	EXTREMELY	took too long

Table 14 shows that searchers have specific cognitive justifications for the affective norm of when to get irritated and how strongly. The table may be summarized for greater clarity as follows:

Irritation--None: affectivity 1-2
- enjoyment and productivity
- quick success

Irritation--Somewhat: affectivity 3-4
- being tired
- paying for access and adds

Irritation--Quite a bit: affectivity 5-7
- only a few results
- no relevant results
- printing problems

Irritation--Extreme: affectivity 8-10
- no relevant results
- being hot
- took too long

There appear to be three main categories of justifying the LAN of irritation in information searching: mood (tired, hot), search results (too few, not relevant), and system issues (paying for access, ads, taking too long).

Table 15
Learned Affective Norms of Feeling Anxious and their Cognitive Justifications

17) How anxious did you feel in today's search task? 1 2 3 4 5 6 7 8 9 10 not anxious extremely anxious Please type in an explanation for your answer:			
AFFECTIVE RATING	SAMPLE CONCURRENT ACCOUNTS GIVEN BY DIFFERENT SEARCHERS	LANs LEARNED AFFECTIVE NORMS OF FEELING ANXIOUS	COGNITIVE ATTRIBUTION
1	I was not anxious at all. I feel better that I am working on this research weekly so not to get stressed out later. It is not due next week which helps me not be anxious.	NONE	no time pressure
2	The results of this particular search did not have a very high level of importance to me (only at this particular time).	NONE	search success not required
3	I felt a little anxious hoping to find a useful article.	SOMEWHAT	uncertainty of success
4	This is the first time that I used the library catalog and its databases.	SOMEWHAT	first user of this engine

6	The computer lab is closing soon so I feel rushed.	QUITE A BIT	rushing due to closing hour
7	I was a little anxious because it was in the back of my mind that I needed something to use in my research.	QUITE A BIT	pressure to come up with something
8	Because it took forever to find something relevant.	QUITE A BIT	took too long time for success
9	I am extremely anxious at this point because I want to finish writing up my report but, I am sleepy and just want to go to bed, but I know when I wake up I would not have finish my task and all day at school I am going to be stressed out because it is going to be at the back of mind that I did not complete my task.	EXTREMELY	pressure to finish even though sleepy
10	The due date is extremely near.	EXTREMELY	pressure to meet deadline

Table 15 shows the cognitive justifications that searchers have for the affective norm of feeling anxious and how strongly. The table may be summarized for greater clarity as follows:

Feeling anxious--None: affectivity 1-2
- no time pressure
- search success not required

Feeling anxious --Somewhat: affectivity 3-4
- uncertainty of success
- first user of this engine

Feeling anxious --Quite a bit: affectivity 5-7
- rushing due to closing hour
- pressure to come up with something

Feeling anxious --Extreme: affectivity 8-10
- took too long time for success
- pressure to finish even though sleepy t
- pressure to meet deadline

There appear to be two main categories of justifying the LAN of anxiety in information searching: uncertainty and time pressure. Both of these affective factors were related in prior research to coping skills, satisfaction, and self-efficacy (Nahl, 2007b, 2005b).

Conclusion

This research has shown that searchers operate with leaned affective norms and their cognitive justifications. These are acquired as a result of socialization training and online literacy. Several types of LANs emerged in the content analysis of written comments that searchers made when instructed to keep track of their expectations and beliefs about the search process and likely success. The type of comments given was prompted by a questionnaire referring to their activity before, during, and after the search session. The important searcher variables were found to involve affective norms of expectation regarding how long the search should take and the uncertainty of search outcome. Affectivity ratings were related to irritation, anxiety, uncertainty, felt time pressure, and self-doubt based on past experience and knowledge of potentially available information.

It is clear that search behavior involves the interaction between affective factors such as norms and expectations, with cognitive factors that justify and give meaning to the searcher's efforts as difficulties are encountered. Further research needs to explore the effect on this interaction due to variation in search topics. In this case the search tasks were specified in the instructions. It is likely that the dynamics between affective norms and self-beliefs may be different wheneach searcher according to interest selects search topics.

REFERENCES

Bandura, A. (1997)Self-efficacy: The Exercise of Control, W.H. Freeman, New York. | Eastin, M. S. and LaRose, R. (2000),"Internet self-efficacy and the psychology of the digital divide",Journal of Computer Mediated Communication JCMC, 6 (1). http://onlinelibrary.wiley.com/enhanced/doi/10.1111/j.1083-6101.2000.tb00110.x/?isReportingDone=true (Accessed June 10, 2014.) | | Ericsson, K. A. and Simon, H. A. (1993) Protocol Analysis: Verbal Reports as Data. MIT Press, Cambridge, MA. Updated 2002 version available on this Web site:http://www.psy.fsu.edu/faculty/ericsson/ericsson.proto.thnk.html(Accessed June 10, 2014.) | | Fishbein, M. and Ajzen, I. (1975)Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, Addison-Wesley, Reading, M. A. | | Nahl, D. (2007a) Social-biological information technology: An integrated conceptual framework,Journal of the American Society for Information Science and Technology, 58(13): 2021–2046. | | Nahl, D. (2007b) The centrality of the affect in information behavior,Information and emotions: the emergent affective paradigm in information behavior research and theoryMedford, NJ: Information Today. | | Nahl, D. (2005a), Affective and cognitive information behavior: Interaction effects in Internet use, Proceedings of the 68th Annual Meeting of the American Society for Information Science and Technology, October 28-November 2, Charlotte, NC, Medford, NJ: Information Today. | | Nahl, D. (2005b) Affective load theory (ALT), In Fisher, K E., Erdelez, S., and McKechnie, L. E. F. (Eds.),Theories of Information Behavior (pp. 39-43), Medford, NJ: Information Today. | | Nahl, D. (1997), Information counseling inventory of affective andcognitive reactions while learning the Internet,Internet ReferenceServices Quarterly, 2(2/3):11-33. | | Nahl, D. (1996) Affective monitoring of Internet learners: Perceived-self-efficacy and success,Proceedings of the 59th ASIS Annual Meeting,33: 100-109. Baltimore, MD. | | Nahl, D and Harada, V. (1996), Composing Boolean searchstatements: Self-confidence, concept analysis, search logic, anderrors,School Library Media Quarterly, 24(4): 201-207. | | Nahl, D and James, L. (1996) Achieving focus, engagement, andacceptance: Three phases of adapting to Internet use,ElectronicJournal of Virtual Culture, 4(1) (February). | | Rotter, J.B. (1990) Internal versus external control of reinforcement: A case history of a variable,American Psychologist, 45 (4): 489–93. | | Seligman, M. (1998)Learned Optimism. New York, NY: Pocket Books. | | Simon, H. A. (1967) Motivational and emotional controls of cognition,Psychological Review, 74(1): 29-39. | | Zajonc, R. (1984) On the primacy of affect,American Psychologist, 39:117–124. |