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Year 2007

Overcoming Psychological Obstacles to
Optimal Online Search Performance

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Overcoming Psychological Obstacles to Optimal Online Search Performance

Successful online searching is more than simply a matter of mastering search technique. Emotions, attitudes and environmental factors like stress also play a crucial role in determining whether an online search will be successful or not. This study focuses on the important relationship between emotion and cognition, how they affect each other, and what the implications are for online searchers. It investigates how affect and mood influence key cognitive functions and can pose psychological hurdles related to motivation, arousal, attention, concentration, self-confidence, and self-efficacy, all of which can be significant factors in determining the effectiveness of a search. Viewing searching behavior as a form of mental and physical performance similar to that of an athlete or performing artist, it draws on the growing body of psychological research on performance which suggests that having the proper mindset can make an important difference in whether a searcher is successful.

Keywords: online, search, psychology, emotion, cognition, performance

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Introduction

Although there is a substantial literature in the field of library and information science that addresses the issue of how to conduct successful online searches, most of it attributes success to a matter of mastering search technique. Little attention has been paid to the role that psychological factors such as mood, emotion and attitude may play in determining whether a search is successful or not. There seems to be an implicit assumption by those who write about online searching that the mental and emotional state of the searcher is of little importance to the outcome of a search.

Only a few articles in the library literature make reference to the role that psychology plays in the search process. An early article by Robert Fugmann, for example, points out the inherent subjectivity that pervades the interaction between patron and search intermediary. The information needs of the patron are subjective because what the patron asks the searcher to find may not be what he or she is really seeking or would accept as useful. Search terms may have different meanings for the patron and the intermediary, and the patron's needs can change during the course of the search in reaction to the emerging results. Not only are a patron's real needs subjective and difficult to define, but the searcher's own subjectivity and bias may influence his or her choice of search terms. The author also notes that the outcome of a search depends on other subjective phenomena such as human memory, motivation, attention, and concentration (Fugmann, 1973).

Another early article in the library and information science literature that talks about the role of psychology in online searching emphasizes the limits of human memory in processing search results. The sheer volume of information available to the searcher

creates enough redundancy to engender a state of overload in many searchers as they attempt to understand their search results. The inability to distinguish relevant results from irrelevant creates anxiety and confusion in the searcher attempting to evaluate results. Additionally, the human mind processes information in a subjective, analog manner that creates stress when the searcher attempts to interact with a binary, digital computer (Vigil, 1983).

A third article in the library literature that discusses the role of psychology in search behavior characterizes searching as a form of problem solving. Since motivation plays an important role in problem solving it is also central to searching. Motivation results from various kinds of affective interests such as attraction to a subject or a desire for knowledge or mastery. This emotional foundation serves as an impetus for cognitive activity such as search formulation and strategy. This leads to sensory-motor activity such as typing, scanning, and manipulating pointing devices such as a mouse. The author concludes by recommending that librarians study the cognitive processes of library patrons in order to make librarianship a genuine scholarly discipline (Nahl-Jakobovits and Jakobovits, 1988). Overall, the library literature portrays online searching as being primarily a cognitive process in which affect has little role. The prevailing view is that the mental process that constitutes online searching is a strictly intellectual, rational and logical procedure largely independent of feeling.

At the same time, recent research in the field of psychology has focused increasing attention to the close relationship between cognition and emotion. Psychologists have abandoned the idea that thought and feeling are two separate realms that operate independently of one another. Instead there is a growing consensus among

psychologists that cognition and emotion have a profound effect on each other. How one feels can play a critical role in what and how one thinks. Similarly, the thinking processes that one engages in can make a significant difference in how one feels (Eich, 2000). This important finding, that cognition and emotion are intimately linked, would seem to have significant implications for online searching, which has been characterized as a largely cognitive process. Yet it has received scant attention in the literature of online searching.

It is the purpose of this study to take a closer look at how emotion and cognition affect each other in the online search process. Rather than attempt to explore all the many facets of this complex relationship, the focus of this article will be limited to one particular aspect. It will concern itself with the mitigation of affective hurdles that stand in the way of optimal online search performance. Although seldom mentioned in the literature of online searching, these affective factors can have an important effect on searcher behavior and ultimately influence the outcome of a search (Oehman, Flykt, and Esteves, 2000). The term “searcher” here refers primarily to professional searchers such as librarians and other search intermediaries who conduct interactive searches of online databases for patron and clients on a frequent basis.

In order to examine how these psychological phenomena may influence the behavior of a searcher, it may help to view online searching as a kind of performance. Much like an athlete or a musician, the online searcher may be thought of as giving a performance in the sense that the searcher is expected to execute a series of highly skilled actions involving a considerable degree of coordination between mind and body with the aim of accomplishing a specific end within a limited period of time. This “performance”

may be executed either in the presence of others (a “public”) or alone. It requires knowledge, planning, and practice in order to do it effectively, and often requires the searcher to “think on one’s feet,” to act, react, and improvise based on the search results obtained. It requires the searcher to rethink or revise strategy and actions based on an ongoing dialectic with the emerging search outcome.

If online searching may be thought of as a kind of performance, it then becomes possible to draw on the growing body of literature on the psychology of performance in order to understand how it is that psychologists help performers achieve optimal results by removing psychological hurdles (Wilson, 1994). Psychologists have studied performing artists and athletes extensively in an effort to better understand the psychological factors that make for successful performances as well as those factors that inhibit performance quality. Based on those studies, they have developed a series of psychological interventions designed to enhance performance effectiveness by removing mental and emotional obstacles. Before examining these interventions and how they may apply to online search performance, it is first necessary to understand some of the psychological factors that psychologists have identified as constituting important obstacles to successful performance. These include problems related to motivation, arousal, attention, self-confidence, and self-efficacy.

Motivation and Arousal

The level of motivation and arousal that a searcher brings to bear on an online search can have an important effect on the quality of the search conducted. A searcher, for example, who is less interested or only partly engaged will likely be less creative, thorough and

persistent than one who is highly interested in the search topic or eager to obtain a particular result. Particularly for more complex and involved searches, this resourcefulness and persistence can make an important difference in the ultimate outcome of a search and in the quality of the search results.

While this may seem too obvious to bear mention, it is important to understand that there is not a simple relationship between a searcher's level of motivation and the overall quality of the search. Psychologists have long known that it is possible to be overly motivated (Yerkes and Dodson, 1908). Individuals who bring too much eagerness to the search task may enjoy as little success as someone who has a relatively low level of enthusiasm. Perhaps the most widely researched and respected theory of the relationship between arousal and performance is the inverted-U hypothesis. According to this theory, as a searcher increases his or her level of arousal from drowsy to alert, the searcher's level of performance increases. However, once the searcher's level of arousal goes from being alert to a state of very high excitement, the searcher's level of performance progressively decreases. This increase and subsequent decrease in performance can be represented graphically as an inverted-U. The inverted-U hypothesis suggests that each searcher has an optimal or balanced state represented by the peak of the curve that he or she must aim to achieve in order to perform at maximal effectiveness. The best search performance is thus more likely to be attained at an intermediate level of arousal. Psychologists now know that very high levels of arousal can be detrimental to the performance of a highly complex task like online searching because they tend to cause the searcher to narrow the focus of attention and lose perceptual sensitivity by interfering with the searcher's ability to process information (Bacon, 1974).

The inverted-U hypothesis indicates that a searcher's "psych-up" and "psych-down" strategies must be appropriate to the task at hand. In addition to arousal level being task-specific, personality and situational variables can also play a role in influencing search success. The British psychologist M.W. Eysenck theorizes that introverted and extroverted personalities have different states and needs of arousal. Eysenck believes that introverts are characteristically over-aroused and therefore prefer a less arousing environment to achieve ideal search performance level. More extroverted personalities, on the other hand, may require stronger arousal levels and strategies to arrive at their optimal level of performance (Thompson and Perlini, 1998).

Situational variables such as the time of day the search is performed, the presence or absence of clients, noise, lighting, and distractions may also affect motivation and arousal. Researchers have found that low impulsive personalities are more highly aroused than high impulsives early in the day, while highly impulsive personalities are more prone to be aroused and to experience performance decrements resulting from over-arousal later in the day (Humphreys and Revelle, 1984). More introverted searchers may be extra sensitive to environmental distractions such as clients and noise, which would suggest that they modify their performance strategies to focus on de-arousal techniques. Clearly, arousal is not a uni-dimensional construct and involves a complex interaction between variables, all of which must be taken into consideration to arrive at a complete picture of motivated and relaxed states and their role in search performance.

Since motivation and arousal play such an important role in search performance, it is important that searchers be able to recognize and monitor their motivational states. Awareness is prerequisite to gaining control of search performance. The searcher needs

to gain awareness of his or her emotional state and level of motivation and arousal in order to be able to adjust them so that an optimal level of arousal is achieved. A searcher's lack of awareness of his or her emotional state generally results from being too concerned with the final result of the search performance rather than focusing on the various components that go into making a search successful--database selection, search vocabulary, limit and expand options, etc. The searcher must not only be able to monitor his or her current state, but must also be aware of the emotional state in which he or she performs best and what he or she has done in the past to attain that state (Ravizza, 1998).

The symptoms of over arousal and under arousal have been well established in the psychological literature and are relatively easy to recognize. Over arousal includes symptoms related to the classic "fight or flight" response. Physiological manifestations include shortness of breath, muscle tension, high perspiration, and a decrease in agility and coordination. Psychologically there may be a tendency to engage in negative self-talk and irrationally pessimistic thinking, accompanied by feelings of anxiety and numbness. These symptoms can cause a searcher to lose concentration, become forgetful, make search errors, or even to "choke" (Baumeister, 1995). Choking is a result of attention deficit which occurs when a searcher loses control of his or her thought processes. Mind and body become out of synch, and body tension causes a loss of coordination of movement. A primary reason why searchers choke is because they focus on the end result of the activity—search success—rather than on the activity itself.

Symptoms of under arousal may be even more common, especially among experienced searchers. It is easy for an experienced searcher to become jaded and overconfident and to believe he or she can conduct a search successfully with little effort.

The overconfident searcher is physiologically under-stimulated and respiration rate and adrenaline levels are not activated to appropriate performance levels. The searcher not only feels in a slump physically, he or she is also likely to feel bored or indifferent psychologically. Thinking may be foggy and dissipated and responsiveness may be sluggish. The searcher may feel a lack of focus and immediacy and may feel “out of it” or “not all there” (Taylor, 1996). The under aroused searcher is easily subject to distraction and is thus prone to making mistakes, to conducting a superficial search, and to settling for mediocre results by ending the search prematurely.

Experienced searchers are not only vulnerable to under arousal stemming from psychological factors such as overconfidence, boredom or indifference, but also to under arousal caused by physical factors such as fatigue and eyestrain. Working with computers for prolonged periods may result in a variety of physical symptoms associated with fatigue including headaches, musculoskeletal strain such as stiff shoulders, and neck and back pain. Professional searchers are also subject to less obvious symptoms of mental fatigue such as difficulty sustaining concentration, forgetfulness, impatience and irritability (Kamienska-Zyla and Prync-Skotniczny, 1996).

The most common fatigue-related complaint attributable to prolonged use of computers is eyestrain. This is caused by lengthy search sessions spent staring into a video display terminal. Many VDTs are improperly adjusted or generate glare which can lead to eyestrain. This in turn can lead to muscle strain. Experienced searchers often work in situations in which the room is improperly lit, the terminal is incorrectly positioned, the screen is dusty and the searcher’s desk and chair are positioned so that the searcher must strain to see the details. Prolonged computer use tends to lead to wide-

eyed staring into the terminal and reduced frequency of blinking. As a result, the searcher's eyes tend to dry out and become fatigued, which in turn leads to more general muscular fatigue as the searcher physically strains in an effort to compensate for poor vision (Atencio, 1996).

Interventions for Motivation and Arousal

There are several interventions that athletes and artists use to enhance their performance which may also be utilized by searchers. Since the key to regulating motivation and arousal is awareness of one's state of activation, techniques that increase awareness will help searchers monitor their physical and mental readiness to search. Searchers can practice focused searching, which requires one to find very specific information about a person or a product, for example. It is very difficult to conduct these searches accurately without paying attention to what one is doing. Lack of success would indicate to the searcher that he or she is not concentrating and suggests that the searcher's awareness is dissipated.

Another technique that searchers can employ to enhance their awareness is to keep a search journal. The journal can be used to reflect on search performance, to recognize both optimal and poor performance states, and to record intervention strategies that have proven useful in restoring a searcher to his or her ideal condition. By keeping the journal next to the keyboard and recording what it feels like to search at one's best, as well as noting feelings associated with stress and distraction such as client expectations, the importance of the search, or difficulties with colleagues, the searcher becomes more adept at recognizing ideal and detrimental psychological states. It provides a valuable

record of monitored levels of anxiety, lethargy, concentration, and relaxation during the search process. Used over time, the journal can be a way to attune oneself to identify positive and negative mental states and how they can be controlled (Ravizza, 1998).

Once searchers become aware of their ideal activation state, they need to learn how to create the right “emotional recipe” to achieve it. Different strategies can be employed to regulate states of over arousal and under arousal. An over-aroused state, for example, can be treated by using either a “body to mind” approach such as Jacobson’s progressive relaxation technique, or a “mind to body” approach like Benson’s relaxation response. It was Jacobson’s thesis that anxiety cannot manifest itself in a relaxed body. He created a series of exercises that involve tensing a particular muscle group and holding it for several seconds, then relaxing it. A person begins at the top of the body and consciously tenses and relaxes certain muscles, then progresses down through each muscle group until the person gradually becomes completely relaxed. This is not only an effective relaxation technique, but also has the added benefit of instilling a degree of awareness and sensitivity to bodily sensations of tension and relaxation. It also gives one practice in being capable of voluntarily inducing a relaxed state. The end result is that a person becomes capable of recognizing states of tension in various parts of the body and experienced in how to relax these tense areas (McGuigan, 1993). The ultimate objective of progressive relaxation is to train the person to automatically and unconsciously recognize and relax tense states.

Another useful body-to-mind over-arousal reduction technique is controlled breathing. No other technique is as effective in controlling over-aroused states. The over-aroused searcher will typically take short, shallow, rapid breaths that exacerbate the

searcher's condition by providing an inadequate supply of oxygen. This oxygen deficit tends to induce fatigue and loss of coordination. Learning to take deep, controlled, rhythmic breaths can help the searcher reduce his or her level of arousal on a physiological level. Once the searcher experiences a degree of physical relaxation, there is usually a corresponding sense of psychological relaxation that ensues.

Rhythmic breathing is commonly used by athletes and artists to regulate over-aroused states. The searcher inhales to a count of 4, holds for a count of 4, and then exhales to a count of 4. There are many variations that can be practiced to alter the rhythm of the breathing by varying the count. Generally, the larger the count, the deeper the state of relaxation that can be induced. In addition to rhythmic breathing, searchers may also benefit from a practice called concentration breathing. This entails focusing attention on one's rhythm of breath. As the mind begins to wander to other thoughts, the searcher must redirect his or her attention back to the breath and away from the intruding thought. Practicing concentration breathing teaches the searcher to stay focused and to ignore distractions (Lichstein, 1988).

Mind-to-body over-arousal reduction techniques can also be effective in controlling states of activation. Herbert Benson, a physician at Harvard Medical School, created a relaxation technique called the relaxation response (Benson, 1983). A person is instructed to sit quietly, close his or her eyes, and progressively relax all muscle groups, beginning with the feet and working upward to the head. The person is asked to breathe slowly through the nose and concentrate on the rising and falling of the breath. With each breath, the person repeats a relaxing word like "one" or "calm" to him- or her- self.

This exercise is supposed to be practiced for approximately twenty minutes once or twice daily.

Just as it is possible for a searcher to reduce the level of arousal through certain interventions, it is similarly possible to increase one's activation level by using energizing techniques. Breathing, for example, can be effectively used not only for de-arousal, but also for "psyching up." Searchers should begin with a normal, relaxed rate of respiration. They should then gradually increase the rate of inhalation and exhalation, while imagining that with each in-breath they are generating more energy and with each out-breath they are expelling waste and fatigue. This technique will ensure that the searcher has ample oxygen to feel alert and energized before beginning a search (Greene, 168).

Like breathing, physical activity can be another effective physiological intervention. Online searching is typically a highly sedentary form of activity. Spending hours seated at a computer can easily induce a state of lethargy and a level of physical inertia and complacency that can be difficult to overcome. By getting up from the terminal and walking, bending, or stretching, the searcher will be able to increase heart rate and blood circulation. Increasing one's rate of physiological activity has a corresponding effect on one's mental state and will make a searcher feel more energized and alert. Increasing the intensity of the physical activity will further activate the searcher and create a condition of feeling "pumped up" for the search task at hand. An added benefit of physical activity is that it may also have a beneficial effect on the mood and outlook of the searcher and thus enhance his or her mental readiness (Raglin, 1990).

Research has shown that those who are physically active tend to exhibit less anxiety, depression, and low self-esteem.

In addition to physiological interventions like breathing and physical activity, there are several psychological interventions that may prove helpful in enhancing energy levels. Imagery skills, for example, involve having searchers imagine that they are encyclopedic experts capable of generating better results with each new search command. Some searchers may wish to imagine that they are omniscient machines; others may prefer to conjure up images of being an expert detective. Each searcher can experiment with different images to find ones that seem to be most effective in improving search performance. Some searchers may supplement images with energizing verbal cues that will enable them to feel empowered and vibrant. Words like “explode,” “charge,” “hustle,” “rock,” etc., can serve as mental switches that activate the flow of energy to the searcher. This kind of high energy self-talk is capable of producing physiological arousal that can translate into feeling an increase in arousal and intensity (Munroe, Giacobbi, Hall, and Weinberg, 2000).

Two other psychological interventions that searchers can utilize to increase arousal are music and the environment. Music can be an excellent source of energy, particularly if one listens to high-intensity compositions. Many accomplished athletes and artists use music to regulate their energy levels prior to performing. Of course, in the settings that many online searchers work in, such as libraries or corporations, it may not be possible or appropriate to play music, especially high-energy music. In such instances, it may still be possible for a searcher to listen to his or her own imagined music internally. The ability to conjure up an invigorating melody in one’s head can be just as

arousing in a physiological and psychological sense as listening to music emanating from a stereo (Karageorghis and Terry, 1997).

Searchers can also draw energy from their environment. The presence of a client who observes the search can be a great impetus to perform at one's highest level. Whether this is the case may depend to some degree on the personality of the searcher. More extroverted personalities may find the presence of another person stimulating. A more introverted person may find having another person present while searching to be a distraction. Talented colleagues may also serve as a source of inspiration, particularly if they are gifted searchers with a lot of enthusiasm for the craft of searching.

Attention and Concentration

Attention and concentration are in many ways related to arousal and motivation. A basic principle of psychology is that as arousal increases attentional focus tends to grow narrower. A low-arousal state results in diffuse attention, in which a person takes in many stimuli from the environment. This is often the case when a searcher is just browsing the web, looking for nothing in particular. If the searcher suddenly sees something of interest on the computer screen, he or she will narrow their attentional gaze to the perceived source of interest and begin to concentrate on it. If the searcher becomes extremely aroused, he or she may narrow attention to such an extent that the searcher actually overlooks an even more relevant item on the same screen (Kremer, 1994).

Most problems that searchers face related to attention and concentration have to do with distractions. Not only are there external distractions like people, noise, temperature, lighting, etc., but there are also internal distractions that the searcher must

contend with. These include thoughts and feelings that may impinge on the searcher's awareness at inopportune times, and which can prove more distracting and more difficult to eliminate than external stimuli. The key to maintaining one's concentration is to eliminate as many external and internal distractions as possible.

Elite performers are able to train themselves to concentrate by not only simulating distracting conditions, but also by exaggerating them. This involves deliberately subjecting oneself to environmental conditions that are either very similar to the ones that the searcher is accustomed to searching under, or that are actually worse. Gymnasts, for example, will practice their most complicated and demanding routines with loud, annoying music playing. The idea is to learn to be proficient in as difficult an environment as possible, so that one will be that much better under normal circumstances. A searcher who dislikes opera might find it useful to try and execute complex searches while playing Caruso at high volume or to practice searching in the middle of a busy airport lobby. Then when it comes time to conduct the actual search, what formerly seemed like big distractions may seem relatively subdued (Singer, 1991). Under simulated or exaggerated conditions, the searcher learns not to react to distractions.

Attentional shift training may also be used by searchers to become more attentive and focused. The way attentional shift training is conducted is to have searchers use mental rehearsal to restore concentration. As soon as the searcher realizes that his or her concentration has been broken, he or she should pause, breathe deeply to relax, and then restore the focus of attention by mentally rehearsing what should be done next. In this way, by paying more attention to attention it becomes possible to learn to be more

attentive. Attentional shift training has been used successfully to improve the accuracy of execution of experimental drills by soccer players (Ziegler, 1994).

Some elite athletes have improved their attention by practicing a form of attentional performance correction. After making a performance error, it is common to lose concentration. One tends to become self-critical, to ruminate over the failure, and to blame oneself or others for the mistake. This has the effect of disrupting attention and shifting focus away from the performance. In doing so, it unconsciously programs the mind to repeat the failure rather than correct it. Attentional performance correction breaks this programming by teaching searchers to reframe failure as success by mentally rehearsing a successful performance. The performer is able to imagine him- or her- self performing the skill flawlessly which helps to reprogram the mind for success (Suinn, 1996). By mentally dissociating oneself from failure and concentrating on successes, one is able to regain composure more quickly and increase one's chances of future successes.

Self-paced events like online searching require a different kind of attentional focus than externally paced events like football or hockey. Self-paced events allow time before initiating the activity while externally paced events demand rapid anticipation, execution, and reactions. Several studies have recently indicated that the appropriate attentional focus for self-paced activities should be external rather than internal. An external focus serves to direct the searcher's attention away from any inner fears or uncertainty. However, this does not mean the searcher should focus on external distractions like noise, movement, or the presence of others. Rather, the searcher should focus intently on the desired effect of the action, which will then serve to block out both internal and external distractors. Focusing on the outcome suppresses conscious attention

enough to allow the performer to execute the task skillfully without becoming too self-conscious or too distracted by external events. It has the effect of slowing heart rate, improving concentration, and quieting the mind (Singer, 2000).

Narrowing attention and intensifying concentration can lead to an optimal psychological state called flow in which action and awareness merge and performance becomes maximized and relatively effortless. Online searching helps to induce flow because it is a challenging, goal-directed activity. The very nature of the online medium itself may be conducive to flow states because of its interactive, hypnotic quality. A recent study of flow state in college athletes found that strong attentional focus was important for getting into the flow state. Focusing deeply on the game increased the performance as well as the self-confidence of the players. Poor concentration and weak focus due to concern about competition, performance outcomes or self-criticism inhibited the flow state (Russell, 2001).

In a study of computer users conducted in 2000, the most frequently reported activity that led to a flow state was information searching. Following links and leads to track down specific information or scanning the search results for relevant data helped to induce deep concentration in users. Some described this state as being almost like merging with their machine. The searcher's sense of time becomes distorted and seems to pass much more quickly before them, and they can get so caught up in the process of searching for and reviewing information that they get lost in it at times, a phenomenon known as telepresence (Chen, 2000). If achieving this state of flow can help an individual deliver improved performance, what can a searcher do to help attain the flow state?

A key factor in attaining flow is attentional control. To strengthen concentration, a searcher should try to visualize executing a search that results in a successful outcome. This helps to focus the mind and eliminate external distractions as well as internal ruminations. In order to elicit a flow state it is important to stay in the present. This is extremely difficult for a searcher to accomplish for several reasons. In the web environment, a searcher is continually being presented with new information that is competing for his or her attention. The searcher must learn to continually redirect attention away from these competing stimuli back to the original strategy. He or she must also be alert to the possibility that some of this information may indicate that modification in search strategy is required. Along with these distractors, the searcher may generate some degree of internal “noise” in the form of distracting thoughts related to previous search tactics. In particular, the searcher will be prone to recurring concerns about what might have happened or what should have transpired in the course of a search.

Not only must a searcher concentrate on the present, but he or she must be capable of sustaining concentration for extended periods--sometimes hours at a time. Since a typical searcher will only be capable of sustaining concentration for a few minutes at a time, it may help to use a technique called refocusing. Whenever one finds one's attention slipping one should gently but quickly return to the situation at hand. If attention still wanders, try breaking the search process down into small, discrete steps and goals and focusing on them. This will help to keep the attention focused on what needs to be accomplished in the moment. It is possible to practice refocusing by sitting comfortably, closing one's eyes, and focusing on one's in- and out-breaths. Whenever one's attention drifts away from the breath or thoughts enter the mind, one should refocus

one's attention on the breath. By noting the time on one's watch that one is able to remain focused, one can gradually lengthen the time that one can sustain concentration on a single object.

Self-Confidence and Self-Efficacy

Given that library and information professionals often engage in various kinds of mediated online searches for their clients or patrons, online searching may be viewed as a kind of performance. The professional conducts the search in the presence of the client, who serves in the role of spectator or observer. Much like an athlete or performing artist, the professional conducting an online search for a client is "on" and must perform to the expectations of the client or whatever audience happens to be present. This performance aspect of the online search process may give rise to certain feelings of uncertainty, anxiety, or self-doubt on the part of the searcher, particularly if the client is influential or the search is important.

Fortunately, there are a number of ways that the searcher can cope with performance anxiety and increase self-confidence. The first is by focusing on quality training and thoroughly understanding what one is doing from a procedural standpoint (Orlick and Partington, 1988). There are no psychological interventions that can effectively substitute for genuine expertise and technical competence. The use of visualization and imagery can be another. Visualizing oneself successfully performing a search may prime the psyche to reproduce the visualized skills on demand. This technique can also serve to enhance self-confidence if it includes actual simulation of the search performance conditions under which the search is likely to be conducted. It

provides the searcher with a set of mental responses to the specific search situation which helps to reduce anxiety and indecisiveness when the searcher is under those same conditions.

The searcher can also learn to manage his or her thoughts through the use of self-talk (Vealey, 2001). This allows the searcher to control how he or she thinks during the course of a search rather than have thoughts dictated by environmental stimuli. There are a variety of self-talk techniques that a searcher can use to help control thinking. One is called negative thought stopping, which teaches searchers to recognize negative, self-defeating statements, to stop them, and to substitute positive, supportive statements about their abilities because negative self-talk tends to undermine self-confidence. Another technique is called reframing, which trains searchers to look at events that they might be inclined to interpret negatively in alternate, more positive ways. Self-talk techniques help a searcher to develop a positive belief system that can lead to greater self-confidence. Some psychologists even recommend maintaining a self-talk log by tape recording negative thoughts as they occur while searching at the computer (Luciani, 2001).

Online searching, because it is a type of performance, inevitably involves various kinds of obstacles, setbacks, and disappointments. How a searcher responds to these hurdles will affect the level of confidence the searcher possesses. Psychologists have studied how individuals react to adversity and have found that whether a person reacts positively or negatively may be largely a function of their explanatory style. In other words, how individuals explain adversity will affect their reaction to it. There are three elements that researchers have identified as constituting explanatory style. The first is pervasiveness, which refers to a tendency on the part of a searcher to attribute problems

to specific people or situations rather than generalize to broader situations or categories. Optimists might say “I hate working with *this* client.” The searcher with a more pessimistic explanatory style might say “I hate working with clients.”

A second element of explanatory style has to do with permanence, which is the tendency to view negative events as happening in an ongoing, continual, repeating fashion rather than assume the event was a one-time occurrence. If the searcher conducts an unsuccessful search and has a pessimistic explanatory style, he or she might be tempted to say “I’m a lousy searcher,” while a searcher with an optimistic style might be prone to say “I’m just having a bad day.” The final aspect of explanatory style is personalization, which is the degree to which one sees oneself as the primary cause of adverse events. Searchers with an optimistic explanatory style will regard negative events as due to outside forces beyond their control, while those with a pessimistic explanatory style will see positive events as a result of luck. It is important to develop an optimistic outlook in order to bolster one’s self-confidence, enhance one’s resilience, and be more productive.

Closely related to the degree of self-confidence one possesses is one’s sense of self-efficacy--the beliefs one has about one’s ability to conduct online searches successfully. Self-efficacy is a situation-specific form of self-confidence. One’s sense of self-efficacy depends in part on similar kinds of attributional phenomena noted in the discussion of optimistic and pessimistic explanatory styles. Individuals with a high sense of efficacy tend to view the course of their failures as due to inadequate effort or situational factors while those with low self-efficacy tend to regard lack of success as being due to low ability. The person with high self-efficacy beliefs will thus exert more

effort to address the lack of success, while those who do not believe they have the ability will see any additional effort as being useless (Silver, Mitchell, and Gist, 1995).

Searchers with a high sense of self-efficacy will also tend to exhibit different memory and attentional processes than low self-efficacy searchers. Those with high self-efficacy notice and remember their search successes while low self-efficacy searchers selectively attend to and recall their search failures, which reinforces their conceptions of themselves as being ineffective. Searchers who thus want to enhance their feelings of self-efficacy and self-confidence should spend more time recalling and reliving their successful searches, while systematically downplaying any defeats they may have experienced.

In addition to trying to think confidently it also helps to act confidently. That is because not only do thoughts influence behavior, but how one behaves can have an effect on how one thinks. By conducting searches in a spirited, unequivocal manner the mind will tend to follow along and generate more confident thoughts. It is important to use body language to project an image of self-confidence and to be assertive, vigorous and quick. Searchers who seem hesitant, or who slump over the keyboard not only convey a negative image to clients and colleagues, but also on a subconscious level may be communicating to their own psyche that they lack confidence and perseverance (Weinberg and Gould, 1999).

Self-confidence and self-efficacy can also be enhanced by using self-hypnosis techniques. Athletes and artists use hypnosis to enhance their performances. Hypnosis allows one to focus attention on the task and maintain emotional control in stressful situations. Although some people may regard hypnosis suspiciously because it has been

associated with exaggerated and fraudulent claims in the past, it is recognized today as a legitimate treatment by both the medical and dental professions. Hypnosis works by using a process of hypnotic induction to create an altered state of consciousness in which the person becomes highly susceptible to suggestion. A person is able to enter into this state by a process of first becoming deeply relaxed. Relaxation is accomplished through a process of slow, deep, rhythmic breathing, conjuring up relaxing images, and systematically relaxing all the muscle groups in one's body.

Once a person attains this highly-relaxed state, the next step is to imagine oneself conducting an effective search. This involves becoming mentally and physically attuned to all sensations, including any feelings of uncertainty and anxiety that one might ordinarily experience during the course of a search. As one imagines oneself generating search terms, executing search commands, scanning results and modifying search tactics based on results, one repeatedly tells oneself that one feels confident and in control, all the while vividly imagining how that feels. The searcher reminds him- or her- self that he or she can recreate these same feelings of mastery and self-assurance at any time during the course of a search by initiating a certain cue, such as slow, deep breathing or counting down from ten to one (Liggett, 2000). With practice, a searcher learns to reinduce this same state along with its accompanying feelings of confidence and composure.

Conclusion

From the preceding discussion it is apparent that the process of searching online may depend to a considerable extent on factors other than cognition and technique. Affect

also can play a critical role in the overall effectiveness of a searcher. Awareness of emotions and control over them can be a valuable skill for searchers to possess because online searching is a form of skilled performance often conducted in the presence of others that makes emotional as well as cognitive demands on the searcher. Coupled with the growing recognition among researchers that emotion and cognition are intimately linked, intellectual mastery of technique is in itself inadequate in determining whether an online search will likely be effective.

Information professionals who spend a substantial amount of their work time online know that search effectiveness is at least partly a function of one's psychological state. One day a searcher may feel motivated, alert, focused, confident, and in control. The next day that same person may feel, dull, unmotivated, distracted, and overwhelmed. These emotional states, if the research discussed in this article is any evidence, can have a significant effect on what one types into a computer, where one takes the search from there, and what one ultimately does with the results. Experienced searchers are often aware of these states and acknowledge them openly. It is not uncommon to hear colleagues say, "I feel pumped today," or "Today it seems like I can't do anything right."

Knowledge of online search technique alone is thus not the only factor that can account for search effectiveness. Self-awareness can be of critical importance, and in particular, self-control. As the preceding discussion has tried to make clear, psychologists have developed numerous techniques that can help the searcher achieve greater control over the various psychological states that each of us is prone to. These techniques can be learned and practiced as easily as search techniques, though each individual will vary with respect to how much effort they have to expend to arrive at an

optimal level of self-control. Even for those who have difficulty controlling their emotions, it may be somewhat reassuring to know that greater control is, at least, possible.

Further research is necessary on the many ways that emotion and cognition affect each other and the search process. Books and classes devoted to online search technique need to devote at least some discussion to the sorely neglected “human” dimension of the online search process. Portraying online searching as a solely intellectual endeavor is myopic and misleading. The field of library and information science can benefit not only from search techniques, but also from applying psychological techniques to the search process to improve its effectiveness. Only then can we begin to arrive at a truly inclusive and comprehensive understanding of what is required to attain consistent high-level search effectiveness under everyday working conditions.

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