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This study describes the findings from coding the transcripts of personal interviews with associate and full professors within the University of North Carolina's School of Information and Library Science. The interviews were conducted to determine whether and how fully-present states of consciousness, known often as flow states in the literature, occurred in the research process.

A definite pattern was discovered wherein fully-present states of consciousness were occurring, but most often not during the active work of research, such as reading or writing. Rather, flow came to researchers when they would take a break from their work to do something less intellectually demanding. Here they would receive a personal insight on how to proceed with their work. Then the researchers would return to work to address the challenge of how to package what they had synthesized in their flow experience into language that could be understood and accepted by other researchers.

Headings:

Consciousness States -- Flow (consciousness state)

Research -- Methodology

ACADEMIC discourse

I DON'T GET ANY INSPIRATION SITTING AT MY DESK:
THE PATTERNS OF FLOW EXPERIENCES IN EXPERT RESEARCHERS

by
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Introduction

This paper is reporting on the results of interviews with expert researchers, to determine whether and how they have experienced what have been called "flow" states in the literature. These are fully-present states of consciousness where there is either a mitigation or indeed a taking leave from the identification of oneself as being consciously separate from the task at hand. The term "flow" was coined by Mihaly Csikszentmihalyi, who noticed in many interviews that people referred to the work that they were doing when they were fully conscious or engaged as "just flowing" or that there was a "flow of energy." These flow states are of particular interest because they are known to be the most productive and creative part of the process of work when they occur, almost the waking equivalent of REM sleep, if you will. Ironically, the people who experience these states seldom consciously decide to do so for the sake of the productivity that they will bring to themselves or their employer, if it is a work situation – in fact, to claim that one would choose to experience flow in order to accomplish another end would be to sabotage almost all chances of flow occurring, and here we find one of the most salient truths about it: that flow happens when the task at hand is known to be worthwhile and sufficiently challenging for its own sake.

In this sense, while work done under flow can have real, positive effects on the community, it is invariably experienced subjectively as an intrinsic reward, to be absolutely immersed in the part of the task of this moment, or nearly so.

Flow experiences have been reported and studied in a multiplicity of contexts, from rock climbers, to surgeons, to musicians, to those living in religious communities, but I have yet to find a paper that specifically addresses this phenomenon in the act of research. I have conducted interviews to determine whether and how these flow experiences occur in the practice of research. We know that in order for flow to take place, usually, the *how* of the task (such as grammar in writing, how to type in typing, balance in skiing, etc.) has to have become something that is so ingrained that the person doing the task doesn't have to actually consciously think about it, in order for a flow experience to be triggered within that activity. For this reason, I have studied expert researchers, who are more likely to be past the stage where they are concentrating much on whether they (self-conscious as separate from the task) are using the appropriate methodology, and who are therefore more likely, I hypothesize, to be able to discuss flow experiences that they have had. I draw this hypothesis in response to the Cutcliffe and McKenna article, discussed in the research methods silo of the literature review, below.

Literature Review

I'll begin with those resources that deal with the issue of flow, the phenomenon of the fully-present state of consciousness. The primary name associated with the study of flow, as is meant in this context, is Mihalyi Csikszentmihalyi, who is responsible for several monographs on the subject, including *Flow: the Psychology of Optimal Experience*. This is one of the more general, and more thoroughly elaborated discussions on flow. This book was almost a popular bestseller. In it, Csikszentmihalyi not only describes his own research, but also pieces together the work of others around the world on a diverse range of populations who experienced the fully present state of consciousness that came to be known as flow. These are moments, however long in duration, where the actor is fully present and cares very much about what he or she is doing. One of the requisites is that the task be a challenge, but one where the actor has a sense of mastery, that success is a definite possibility, but not guaranteed. When all of these criteria are present, the sense of the self as separate from the task at hand is either dimmed or entirely forgotten; the result is a highly pleasing, highly productive, and highly creative experience of "flowing." Many specific dimensions of flow are considered, from the sense of identity of the actor, to the relationship of action to motivation, to a sketch of the minority of generally very happy people who seem to be able to make almost any task into a flow experience.

One of the most convincing cases is his reference to an amusing but poignant study where participants reported how they felt after an activity. The

activities were measured by several variables, including the number of BTU's expended. The scale used in this case was an energy scale. The activity at one end of the scale might be racing airplanes, and at the other extreme he places reading a book. Reading books, which expends very little energy, makes people happier than racing airplanes, which burns through a great deal of fuel, and he argues that this is partial evidence that a great deal of one's enjoyment in life is from whether we can find intrinsic rewards even where extrinsic rewards are lacking.

Another of Csikszentmihalyi's monographs is *Creativity: Flow and the Psychology of Discovery and Invention*, which discusses the results of dozens of interviews with people who are known to be creative, and attempts to apply the findings to a flow framework. Creative people are found almost everywhere, doing almost every kind of task, but it's something about them and what motivates them that brings creativity to these tasks. Unlike the above book that describes flow as a phenomenon with certain preconditions and triggers, this work assumes that flow is present in almost every case, but then asks how it is different in different contexts (e.g early in life vs. late in life, at home vs. at work vs. with the whole world's wellbeing in mind.) The central argument is that while there are some contexts that are more conducive to creativity than others, there really are creative people who make the most of them, rather than creative situations that inspire flow in everyone who encounters them.

A third of his books is *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play.* This is the twenty-fifth anniversary reprint of a book that actually predates the eponymous textbook on the subject, which headed this list. Referring to a specific set of interviews and tests done on flow experience, he makes a more generally applicable statement of the core phenomenon of the autotelic experience, and the kind of people who tend to have them (autotelic personality) on page 179, "The study began with this question: Do activities for which extrinsic rewards are minimal provide a set of intrinsic rewards of their own; if so, what are these intrinsic rewards?" Whatever extrinsic rewards may be forthcoming, from the point of view of the person in flow, they are really just bonuses to the highly intrinsic and subjective experience of flow. Subjective though its triggers may be, the experience is described similarly in a great many contexts.

In another book, which Csikszentmihalyi wrote with Frank E. Robinson, *The Art of Seeing: an Interpretation of the Aesthetic Encounter*, the issue of flow being caused by, or manifested in reaction to, an environmental factor, is explored in much greater detail, specifically as it occurs in aesthetic experiences in public places, such as museums and galleries. In this book, the authors specifically address aesthetic experiences – specifically those had by the viewer of artworks, as opposed to artists - as a subset of flow experiences. Again the theme of identity is prominent, but this book is less concerned with the person having the experience than it is with the conditions in a museum

or gallery that seem to promote or inhibit flow. It is almost impossible to have an aesthetic experience, of example, in a very crowded room where you're concerned about how you might appear to the others there. The consciousness of a self-as-opposed-to-others occludes the connection and the safety of the loss of self that is inherent in flow, just as the anxiety of a self-as-opposed-to-what-I'm-doing-and-whether-I'm-doing-it-correctly also inhibits flow, which is why it is more common in those who are very proficient at the task wherein they experience flow.

Continuing with the environmental theme as it relates to flow, Csikszentmihalyi also wrote a relevant contribution of a chapter to an anthology, "Implications of a Systems Perspective for the Study of Creativity," where he elaborates on the role environment plays not so much in the elusive aesthetic experience, but in developing people who have the predisposition to finding creative solutions to problems, and these solutions are often to be had in the midst of flow. He argues that regardless of the raw intelligence of a person, they cannot merely be put into a vacuum and expected to create – the community and the stimuli being presented have a lot to do with how creative someone will become and what problems they will set out to solve. Certain cultures (using the term very broadly – a nuclear family could be a culture) are very restrictive to creativity, either not acknowledging flow or only welcoming it when its creations are coming from the lips of "elders" or "priests," while other environments place a premium

on creativity and stress that it is something everyone possesses. This more democratic view may be found in a few places, while some cultures seem to value creativity in some areas but are very restrictive in others, such as those schools that teach art to young children but imply that it is "kid stuff" as the child becomes an adolescent.

Another relevant chapter that I found on flow is Nicola Baumann's "Autotelic Personality," which refers to the designation that Csikszentmihalyi gave to those fortunate people who have either the gift or the predilection to make a flow experience out of almost anything. While flow is often thought of as a valued "experience" that may come once in a while, or when someone is fully engaged in their passion, there are people, whom Csikszentmihalyi identified as "autotelic personalities" who have a sort of playful, expectant bearing toward life in general and who seem to be able to find the flow in almost anything. Baumann describes her research of the personality dispositions that are "boundary conditions for the flow experience" in this chapter. Not surprisingly, given what we have seen, these individuals have a low need for extrinsic reward, and are not off put, but enthusiastic about the challenge of learning something new. In other words, they make their own fun. Fun, as was explained in the Flow book, is not an easy activity, but a challenging activity that you want to do, so obviously a person who could find intrinsic rewards even when extrinsic rewards are absent could find

motivation and fun in many more places than someone who is stirred to action primarily or entirely by externals.

Dr. Baumann and David Scheffer also collaborated on another chapter on a related dimension of the autotelic personality, or at least a variation on it, where, the enjoyed flow value of doing a thing, at least in the moment it is being done, eclipses the moral, remunerative, or social fruits of the labor, which become distantly desirable byproducts of the flow. In their "Seeking Flow in the Achievement Domain: The Achievement Flow Motive behind Flow Experience," Baumann and Scheffer announce that they hope to "operationalize Csikszentmihalyi's concept of autotelic personality" in this paper, where they argue that in such people, there is a consistent achievement flow motive that is characterized by "[…] strivings experienced as curiosity and interest in learning something. Thus, the achievement flow motive is the amalgam of the aroused need to master challenging tasks (seeing or seeking difficulty) and its mastery-approach implementation (mastering difficulty)." Where Csikszentmihalyi explained that autotelic personalities exist and described their effects, here the authors take the contraption apart and look for its essential elements. I love this paper it makes

A second area that I wish to explore is regarding the relationship of memory to reward (the experience of flow being pleasing and a kind of intrinsic reward, that those who experience it seek out again) to help me

understand what would trigger a flow experience, and what would lead someone to recall it in an interview.

In Autumn Glenberg and N. H. Anderson's article, "What Memory is for," they argue that the phenomenon of memory is "embodied," which is to say that we form memories specifically tailored to how we identify our bodies interacting with our environment in a given situation, so that when a similar situation presents itself, we may "mesh" the memory that we have with how we perceive the new situation, so that we can use our bodies to negotiate it. For example, if someone is seven feet tall, the memory of entering an airplane, with its short door, will be embodied very differently from the memory a three-foot tall child will embody. A healthy memory contains within it the ability to revise the memory in each situation, so that it gets closer and closer to reality, but some situations are so traumatic that they leave a very strong embodiment that is very difficult to revise, which becomes prejudicial. Of course, memory is not strictly about and for the body, as we associate emotions and thoughts with predominantly intellectual experiences and stimuli as well. But however the actor identifies, these mechanisms of embodiment have their origin in, and present as, narratives written in response to the body.

As this relates to flow, the question will be, how does someone who has had a flow experience seek it out again? If someone had a flow experience while windsurfing, for example, will they associate the feeling with

windsurfing, which they will then become more passionate about, or will they recognize an ability to find flow in contexts other than the one that initially triggered the experience?

Continuing with the theme of reward, Kristy A. Nelson and Ted Bryant in their essay, "The Effects of Non-Contingent Extrinsic and Intrinsic Rewards on Memory Consolidation" explain how reward - which is both a neurobiological and psychological phenomenon - serves as the motivation for behaving in a certain way. Our memories not only help us negotiate situations, but to the specific end of achieving reward. What constitutes reward varies widely, but in this study, subjects were told that they would be given rewards for completing the survey successfully. One of the rewards was a dollar. Another of the rewards was praise. The money motivated the participants, because it had the same value before and after the survey, but the praise, if it was guaranteed, had little value. Praise, it would seem, is not a commodity, but is something that we only value if we believe it, and it is difficult to believe if we are told beforehand that we will get it no matter how we perform.

What are the chemical, neurobiological grounds for the function of reward? Daphne Shohamy and R. Alison Adcock in "Dopamine and Adaptive Memory" discuss the role of dopamine, a hormone in the brain, and reward. Memory is intimately connected to our ability to seek and achieve rewards where we found them before, and dopamine has a lot to do with this

feeling of being "rewarded," which floods our brains when we experience reward, and our brains are wired such that we usually remember such an experience well. Memories in which dopamine plays a significant role are what the authors call "episodic" memories. These may be things that happened only one time, but they are often remembered in specific detail. When stimuli in the environment match up (itself a very complex set of operations) with cues from episodic memories, we begin to anticipate reward and are motivated. The autotelic personality is one that can find reward within his or her own mind, and that does not need to wait for stimuli to remind him or her that rewards are forthcoming; therefore, for such a person, there are potential rewards to be found everywhere, not in the environment, but in how he or she chooses to respond to the environment, and such people are often "rewarded," and therefore joyful, much of the time.

Memories are not all considered by the subconscious to be created equal, like the passively ordered reams of cards in an old library catalog. They appear to be organized as having apparent relevance with regard to each other, to better serve the construction of a theory of the patterns around which reward or danger can be expected to be forthcoming. Jonathan L. C. Lee in his article, "Reconsolidation: Maintaining Memory Relevance," elaborates on what happens when a memory is recalled. Every time a situation or a thought triggers a memory from another time, that memory, in the context of the new situation, is made vulnerable and is open for revision,

based on whatever new data are assimilated by the senses this time around. This plastic nature of memory is essential for survival, as the world is changing and pliant, so it would be an enormous evolutionary disadvantage for the first memory that we developed about something to be the last word on the subject, as far as our consciousness is concerned.

Regarding how flow specifically relates to researchers, for use in defining an expert researcher for the purpose of selecting interviewees for my project, I have yet to find research that has been done specifically on flow as it applies to researchers. That said, in the hope of gaining some perspective on what constitutes an expert researcher, one article in particular by John R. Cutcliffe and High P. McKenna, called, "Expert Qualitative Researchers and the Use of Audit Trials" has proved helpful. While this paper takes place in healthcare, arguably beyond the scope of information science per se, it is an example of a paper where an operational definition of "expert researcher" is indeed provided. The authors state that they assume that "[expert qualitative researchers] are analogous to expert nurse practitioners." They reference definitions of expert nurse practitioners in the nursing literature, and then tailor a synthesis of that definition. One of the key components of experts is that "[a]s a result of their extensive and cumulative experience, they have an intuitive grasp of situations and zoom in on the accurate region of the problem." Secondly, they are very experienced - that is, they have spent many hours actually practicing their craft. Third, they tend to quickly make sense of

the bigger picture, creating a holistic framework of a problem, rather than seeing a problem in isolation. Fourth, they do not stringently adhere to an established methodology. They know where and when to deviate from the orthodox order of steps to take to address a problem, and they know when they can afford to skip certain steps. Fifth, and here the paper begins to take on a Csikszentmihalyi-ish tone, they have assimilated the rules so well that they don't consciously think about them, and so "[…] their analysis becomes fluid, flexible, and highly proficient." Later in the paper they describe how even the best methodology, followed perfectly, does not substitute for the intuitive, synthetic, diagnostic ability of experts. And sixth, they make decisions on a level beyond words, which they may explain by saying things like, "because it felt right. My intuition prompted me." Of course, it will be impossible to make use of all of these in selecting the subjects whom I choose to interview as "expert researchers," so I am going to create an operational definition on the assumption that with enough years of experience (the second item, above) that there is a likelihood that the other elements to expert research would be present. This is the only paper that I could find that explicitly defined "expert researcher." Since almost all scholarly articles present the results of research, often by experts, it is a bit like asking fish to describe water, which of course is something that they do not think about very often, because its presence is assumed a priori.

Methodology

In conducting this research, I wanted to ask whether flow experiences occur for expert researchers in the act of research. A second working question was, "how do expert researchers (operationalized in this study to represent those who were either associate or full professors) describe their process, and do they experience moments of flow (fully present state of consciousness where the self is forgotten and the researcher is immersed and engaged with the task)?"

A third question, "how do expert researchers describe their process in relation to flow? And if so, how often do these experiences occur? Are there particular research tasks that are especially conducive to flow?"

To answer these questions, I interviewed five people who fell within my operational definition of "expert researcher," i.e. either being associate or full professors, about whether they have had what the literature would call a flow experience. At first I was debating whether I should leave their memories of flow experiences completely open for them to discuss, or whether I should ask them to explain whether they have had such experiences when acting on a specific task in their research (e.g. selecting resources from databases, or browsing shelves.) The advantage I predicted for going the latter route is that at least all of the interview subjects will be talking about a common context. A possible disadvantage that I saw was that if I narrow my focus to one task, or a cluster of tasks, that some interview

subjects may have had definite flow experiences that they can speak about vis-a-vis that task, while others, who may very well have had flow experiences elsewhere, may have nothing to say about them regarding the particular task that I have chosen, and therefore I would be missing valuable data that they could provide. A few interviewees discussed times during their active research work when flow occurred, but what I consider to be my most significant finding was that the time when a researcher is most likely to experience flow is when they have taken a break from the act of research. Furthermore, I had expected that expert researchers would make use of their practice of research beyond formal academic work, and sometimes they may experience flow when applying their expertise to areas outside their area of expertise, such as when looking for recipes or film screenings, but really none of the subjects discussed this. There is a definite pattern between being "on the job" of research and at rest, namely that the big insights, the syntheses between the ideas that they have spent hours thinking about, happen in these moments of rest, almost like the break in the Tesla coil that makes alternating current carry on potentially indefinitely.

I began the interviews by asking more general questions, ones that allow for answers to apply to a broader swath of the interviewees' lives, specifically things like, "What are some of the most subjectively positive experiences that you have had in doing your research?" The usual response to this was that they weren't certain what I meant by "research," because it

was such a broad term from their point of view, and this may be related to the fact that my interview subject were all faculty within UNC – Chapel Hill's School of Information and Library science, where the discipline of information science being studied makes use of a real plurality of methods. As the interview progressed, I allowed the people that I was speaking with to gradually become more specific, and for them to direct the discussion toward the times in their careers that they experienced flow. If this was difficult, usually because it seemed to them that I was asking questions that were too vague, I would occasionally try to help them along by asking whether they had ever experienced one of the hallmark trappings of flow, such as, "When you were involved with that activity, did you ever feel like you were losing track of time?" In this way, they directed the interviews while I gently lead them to the discussion of what I call "flow."

In the interviews, I tried specifically not to give the subjects the language that I would want them to use, such as the word "flow." This is so that if they had another word to describe the same phenomenon, or related phenomena, I would keep from restricting or discouraging their ability to expound on their experience by giving them the terms that I would expect them to use in order to speak to me. Rather, by giving more general questions, and steering them in the direction of the more specific topic of my research, if necessary, but gently so. Mostly I hoped to just allow them to answer in their own ways, and if they began to describe what I from my

acquaintance with the literature would call flow experiences, once they give me their own words for these phenomena related, I was usually certain to use their language, their words, and allow them to answer in the way that was most comfortable for them. I specifically intended to not have a script of questions that I would be cramming them into like a Procrustean bed, and it was very fortunate that I took this tack, because otherwise I wouldn't have been as open to learning about the pattern that flow seems to manifest as it relates to academic research.

I began, as I've mentioned, with very general questions, asking whether they have had experiences in their research where they have felt entirely present and engaged. I hoped to discern, in listening to their stories about their research experiences, what the triggers to the actual flow experience were. Using my method of beginning with more general questions and then asking the interview subjects to elaborate on what seemed to me to be flow or something leading in that direction. I was able, as I moved from one interview to the next, to grow in sensitivity for what I was looking for, and what the patterns were.

Eventually, in most interviews, I was able to get to a point where I could hear their own research vocabulary, and intuitively sense what they were talking about in terms of my familiarity with the literature on flow. In other words, I found that a way to "talk about flow without talking about flow" was to use their language, let them tell me what they've experienced,

before I committed the error of pigeonholing what I thought that they're saying into some category that fits something that I may have read. For example, I never told the interviewees, "Oh, you're having such and such a flow experience," because forcing my vocabulary onto them could have curtailed their ability to explain what they had experienced, because they would not only be telling me what they experienced, but also would have been trying to fit their story into my vocabulary, which could have altered the data. The exceptions to this were when the interviewees themselves were familiar with some of the literature on flow, and they were able, on their own terms, to contextualize what had happened to them in light of it.

What I thought was going to be a more minor aspect of the interview process actually became very important to me in terms of receiving answers from the subjects where they came to speaking of flow experiences, namely, what their feelings while they were doing this or that task in their research, or, later, as the pattern that I'll describe below became apparent, when they had taken some time to step away from their active research work. When they opened up about what they felt, they began to use their own vocabulary, which was in most cases not the standard vocabulary in this branch of human psychology, but was within what made sense to them the most, given their expertise, and their ontology. What I gleaned from this that I consider even more significant is that flow is a very personally and emotionally felt experience. It's usually not something that one shares with others. Even if

flow occurs in collaboration, there is still the need to step down the intensely personal, emotional event that is beyond language into words that can be understood by others. If these others are people you've co-authored fifteen papers with, it's almost an unspoken, clairvoyant event, but if these others are audience members at a conference in a discipline that you don't consider your primary area of expertise, there is that much more work necessary to communicate what was synthesized in the moments of flow.

I asked in most interviews about whether and how barriers such as writer's block were overcome, because it is often a flow experience that helps someone get out of the limitations of what they may had been previously assuming and become open to creative solutions.

Here are some of the guiding questions that I used (or some variation of them) in most of the interviews:

-"Tell me about the best experiences you have had while conducting your research."

-"Do you feel differently when researching in an area that you are more expert in than when researching material that is less germane to your expertise?"

-"Have you ever felt 'blocked' in your research? What events, activities, environmental factors, or new data have been turning points in your research? What has gotten you 'unblocked'?"

-"How does being 'blocked' feel? How does it feel to become 'unblocked'?"

-"Of what value is intuition to your work?"

Immediately after each interview took place, I made notes for my own reference regarding my impressions of the interview, such as what facial expressions I noticed when they began to really remember and speak about their flow experiences, how they put their discussion of flow into the context of their own profession as researchers, what vocabulary seemed to be recurring, and what other patterns, if any, were forming threads consistent from one interview to another, and anything else that seemed relevant. I also took mostly mental notes on myself, asking what questions or behaviors on my part were helpful to allow my interviewees to open up about their experiences, and which of them seemed to have an alienating effect. It became clear by the second interview that my use of the word "research" was usually too vague for the interviewees. I also took that opportunity after the interview to self-reflect on my own emotional impressions about the interview. In other words, was there anything that I was doing that led to a block in the "flow" of the conversation? In this way I hoped to begin to learn what to look for, and I became better at conducting the interviews in such a way that quality data were produced, as the interviews progressed.

What I found is that the interviews mostly went well because I mostly listened, and the more I allowed these faculty members to tell their own stories in their own ways, the more at ease they felt to let me know what mattered to them, and whether we call it "flow" or not, our flow experiences

mean a great deal to us, although we sometimes ascribe this significance not to the flow experience but to the activity in which it occurred.

My next step was to transcribe and code each interview according to a system that allowed for definite, comparable numbers or occurrences of, and densities of references to flow experiences to be derived. What I mean by "comparable" is that some of my interviewees referred to their flow experiences by different names, and so, given the notes that I had taken after each interview, I was hoping to be able to say that "for interviewee 1, this collection of vocabulary is associated with flow, so in scoring their interview, I am looking for those words, whereas for interviewee 6, this different but related set of vocabulary refers to what I would call a flow expertise, so in scoring their interview, those words are the ones that I am looking for," and then, having scored each interview on its own terms, I was able to come up with a sense of how often the expert researchers that I interviewed discussed flow experiences, and answers to the research questions would reveal themselves.

Since they are interviews, this research could not be generalized, unless perhaps I interview hundreds of people, and I often found myself wishing I had the time to do that. That said, the patterns indicated here could inspire more research that corroborates or expands on my findings regarding what factors go into flow for researchers, so that perhaps suggestions could be made that those factors that are environmental be implemented somehow

into the design of study guides or research methods courses. Is there any way to design a research project such that the work done on it is more likely to just "flow?" My answer to that question is, "absolutely yes."

Findings

In the interviews it became apparent that there was a definite pattern to the flow experiences that were reported by the subjects. I mentioned in the previous section that I hoped to discover what the triggers to the actual flow experience were. What I learned was that the trigger par excellence, is, paradoxically, *not* trying to do research – that flow happens to researchers when they take a break from their work. The interviewees said that the time when that they felt the most engaged and in the moment with their work was rarely when they were involved in their research activities. As subject 2 said, laughingly, "I can tell you I don't get any inspiration sitting at the desk." Rather, flow was reported to occur as either a flash or a period of insight when the scholars had taken a break from the active work of research to do an activity that required very little active intellectual commitment, such as driving, walking the dog, or exercising. For example, Subject 1 described an insight that came to her while she was swimming, "It was really causing me a lot of stress. And I remember one day, I was actually swimming – I have this whole memory, now, of this incident, I was in the pool, and then suddenly it dawned on me […]"

I found that flow was usually occurring during times outside of active research work, and so the answer to the question of how to promote flow in the act of research is not to promote specific outward behaviors, but to promote a rhythm to scheduling one's work that a periodicity might occur where the flow happens in the times of rest from active work. It doesn't really matter what the activity is during this rest, so long as it is something that the researcher can do without taking too much active thought about it.

Many researchers specifically mentioned this happening while driving. The reason for this is that because the mechanics of driving are so ingrained, and because the driver knows where she or he is going, how to drive and navigation do not take up much conscious intellectual energy, and so the focus can be put into reflecting on research. Subject 2 said, "driving is probably the best. You know, you're driving, even though you're concentrating on the road, unless, it is, you know, what do you call it? – engaging you, if your brain can do other things."

All but one of the interview subjects reported flow as occurring in this way. Subject 1 said that "I go walk my dog, that I might have some insight, or something, um, but, um, yeah, so most of the examples I can think of are ones that happen after I've left, you know, disengaged from the particular activity or where the problem is happening, and go do some other activity." And the way they described it was that it was an intrinsically gratifying experience. Subject 4 said that she felt as though she had, "suddenly jumped above all the

stuff you've been plodding through, and you're suddenly, you see it from a different set of eyes. It seems clearer to you, and you think you've achieved something."

One of the prerequisites for this flow experience to happen after the researcher has stepped back from their work, however, is that the topic of their research must be on their mind somehow. They have to be infused with it, and that is the result of a lot of what can feel subjectively like fruitless work. An interesting finding here was that those two people whom I interviewed who identified themselves as scientists seemed very conscious of this. They reported that they were "always thinking" about their work. Subject 5 said that he walks many miles every day, and that while this is not his active research time, he nonetheless "picks a topic and thinks about it" as he's walking, and it is on these walks when he reports getting a lot of his best, most synthetic ideas. Subject 2 identified himself as "constantly thinking about my research" even when driving.

Meanwhile, Subject 4, who was in a sense at the other end of the spectrum from empirical research and did not consider herself a scientist at all, spoke for the rest of the research subjects about what I consider to be the same phenomenon in this way:

And you're, but somewhere at the bottom of your brain – somewhere, maybe not the bottom – somewhere it's still percolating, because suddenly it pops out, and you think, "oh, my gosh!" And this doesn't happen all the time, but when it does happen, it's a really good feeling,

and I've gotten more breakthroughs away from my work than I have when I'm actually doing it, when I'm actually consciously saying, "I want to work on my research."

-Subject 4

While the flow experience is rewarding, it is bookended by what researchers described in the interviews as two "slog periods" (to use Subject 4's phrase) both before and after this experience, where the work usually amounts to drudgery. The first slog period is one in which a conscious attempt to synthesize the findings of others is being made. Subject 3 spoke for almost everyone when she referred to being "not sure how to go about it, so, long periods where it's just, like, me banging my head against the computer, or me reading lots of stuff, and throwing books around the office." And Subject 2 reflected on this fact of life by saying, "There will be ups and downs, otherwise there would be nothing to research." Subject 4's exact words on what it feels like to be going through this blocked but engaged state were:

Well, that wasn't much fun, I mean, I think we all go through these sort of slog periods. It's not, I mean it's part of life – you know, you're clumping along, and you're trying to get through the stuff and, you know, there's a task to be done, and it's like a, you know, something that has to be accomplished. But then, suddenly, the way is sometimes made clear, [snaps fingers] just like that, when you suddenly get an insight.

-Subject 4

The one exception to this part of the pattern was Subject 1, who said that she doesn't "really get blocked very much – which I guess I should be

thankful for, I guess." But she didn't ascribe her lack of writer's block to a random stroke of good fortune. Rather, she claimed she loved to write and that she had a system, described below, for remaining engaged in the topic at hand.

The second slog period is what happens after the flow experience. In flow, there is this synthesis where everything becomes clear, but it is only really clear within the subjective experience of the researcher, and it is usually on a level beyond language. Flow is a very personal and intuitively felt experience. Subject 2 called it "the flash." Then comes the work of packaging this insight into language that people can understand, and finding acceptance of those words in a journal or at a conference. That is a whole other aspect of academic work that is not generally reported to be fun. Subject 5 called it the hardest part of all. He said that, "the harder task isn't the research, but it's the interactions with the external world. Getting other people to accept the research, or the results." And subject 3 mentioned that really the insight is just the beginning. The hard work comes later. She said, "it wasn't like […] *everything* is clear before me, because, um, as a result of that insight, I *did* have to go back and adapt some of the things that I had already thought, right?"

How much of researchers' lives were taken up with the dread of the phenomenon of "getting other people to accept the research" was one of the surprises of this study. Every interview subject talked about it. Subject 3 described the

sometimes long and frustrating process of not only saying what you want to say, but, um, saying it in a way that will be persuasive and convincing to other people, because a large part of research isn't just having the insight or de- coming to the understanding yourself, but in framing that so that other people can both understand it and accept it, and that is often just, like, hard and frustrating, and, um, many tedious drafts.

-Subject 3

Even subject 1, who had a system of escaping the drudgery of the first slog period, was not immune to the difficulty of this second period. She talked about working with one of her PhD students, "[…] and [my PhD student] had an idea about – well, she had some data and she wanted to submit – write this up and submit it to a conference, but I thought, 'well, the way you're talking about it, nobody at the conference is going to be interested in it, so let me think a little bit more about it.'" Thankfully, she had a flow moment that resolved this difficulty. On this matter, Subject 2 said that "The 1% of flash, and then 99% of it is getting that into reality. So that's the main problem." By "getting it into reality," he was specifically referring to the process of communicating what he had synthesized internally in flow to a wider audience. Subject 4 had something similar to say, but her numbers were a little more optimistic: "I don't think it's 99% slog work. I think it's more than that. I think it's 10%, you know, sort of exhilaration. Maybe that's not right. How do I know? I have no idea, but I think 90-10."

So there is a three-step process, and while flow moments can sometimes occur in each step, it is in the second of these steps that the real

synthesis is made. First, there is a slog period of searching for and reading

through many different sources. Second, after this has been going on for some

days, weeks, or months, there is a breakthrough moment or period, usually

when the researcher is taking a break from the work of reading others'

research, often while driving or exercising, when the actual synthesis is made,

and the researcher feels very much engaged and fully-present. The third

phase is taking what was realized and communicating it in such a way that it

gains acceptance in the scholarly community. This part is itself made up of

several steps, each becoming both less personal to the researcher while

simultaneously becoming more understandable and relevant to a broader

audience. I would argue that the first of these phases isn't even consciously

linguistic at all, but is felt as an intuitive flash, that must be fleshed out, and

then packaged in such a way that it gains acceptance either in a publication or

at a conference. The first and third of these steps – that is, the slog periods –

represent the difficult work, and are rarely reported to be enjoyable

experiences. Because of this, researchers explain that what keeps them going

through these times are either a personal interest or investment in the

material, or in what it could contribute. Subject 4 said that this was absolutely

essential, "I mean, so if you start with a project you really are interested in, I

think that sort of, you know, that keeps you going in the midst of the slog

periods." Another motivating factor that is external is the knowledge that

deadlines are approaching, and the recognition that something must be

produced by a certain time, or the previous work will have been in vain. As subject 3 said of deadlines, "what? Are you not going to submit it after this time? That's kind of the beauty of a deadline."

That said, there were some reports of flow occurring in the active work of research. It quickly became apparent in the interviews that there is no particular research activity that is especially conducive to flow, but rather this is a matter of how the researcher feels about and contextualizes it. If it is something that she or he finds particularly engaging, then flow is more likely. Subject 4 was in Oxford to study the integration process of the libraries, and while there came across print references to the first woman hired as a librarian at the Bodleian. This topic fascinated her, especially since there had been up to that time nothing published about this historically significant librarian. Despite this being research that the subject was doing on the side of her ostensible reason for being in Oxford, she took it upon herself to endure a great deal of what most researchers would classify as their slog work, but it didn't feel like slog work, subjectively. She said,

I mean, she was a really a fascinating person. So, you know, I just couldn't find any of her, any information about her. So I started doing all this research about this first woman librarian, and it was like, I was looking in old newspapers, I was looking, I was looking in genealogical websites that looked at British families, and I was able to piece her life together, but I could not find, I could not find anybody who had done it before, and I think, you know it was so, it was so challenging, but it was, like, so much fun, because occasionally you'd turn up something and it would give you another hint of somewhere else you could go. I just absolutely loved that research. It was like a detective story.

-Subject 4

Subject 1 described how she had a system for remaining engaged with her writing long after the moment of insight had passed. She said, "You have to create your own flow," and her means of doing that was to consciously stop writing and then pick it up again the next day, knowing which idea she was in the midst of fleshing out. She described her own system, which she tried to teach to her research methods students, in this way:

If we stop before we're ready, where we still know where we're going, where we still see what the next few steps are gonna be in our writing, where we still feel really good about what we're doing, if we stop then, then the next day is gonna be that much easier [snaps her fingers] to kind of get back into that same mindset, get that flow going again, um, because it's just gonna be a more continuous thing, and we're not also, kind of expending all of our mental energy and spiritual energy that we have, which is part of what goes into flow.

-Subject 1

To summarize how the pattern manifests itself, it's usually a matter of stepping away from the main, externally manifested work of research, and then coming back to it newly inspired, or at least refreshed. Subject 2 said, "When you disengage and reengage, you actually *can* get restarted. It's not just, people tell you just to do it. No, it really helps." But subject 5, who described much of his work as translating human language into computer-actionable language, and who therefore thinks a lot of the time about definitions, had perhaps the most interesting observation about what it really means to be making this synthesis. He said:

So, um, maybe the fully-realized state of consciousness is when I'm asleep? [both laugh] A third answer: so you can see the same process I'm going through right now – I'm coming up with the problem, and then I'm thinking of general solutions, and, "what's the simplest one?"

-Subject 5

Conclusions

Mihalyi Csiksentmihalyi describes in his book, *Flow: the Psychology of Optimal Experience* how the flow experience happens in process, in other words, while the action is being taken. Most of the flow experiences outlined in the book are about being so in the moment of the process of the task at hand that all consciousness of other considerations, even self-consciousness, seem to dissolve. In flow, precisely because there isn't a self to be made a fool of, that self performs in a most unfoolish way. Reflecting on the flow experience reported by a member of a Japanese motorcycle gang who reported very vividly this loss of self in the moment, he summarizes that "What slips below the threshold of awareness is the *concept* of the self, the information we use to represent to ourselves who we are." (1991: 64).

On the other hand, not everyone who would experience flow needs to go join a motorcycle gang. Csikszentmihalyi describes those people who are blessed with what he calls "autotelic personalities," in other words, those who are able to turn almost any activity into a flow experience by consciously choosing to make it a challenging (but not impossible), and worthwhile pursuit. (1991, 83ff.) We might say that academic researchers, in choosing work that is usually intellectually demanding but of great personal interest to

them, inherently tend to exhibit some of this autotelic behavior. That said, given what I learned from my interviews, that flow doesn't seem to be happening during the active work that most of us call "research," we can reasonably ask, "At what point does scholarship, this work that scholars are passionate about, occur?"

When we think of the work of academics, we often describe the outward manifestation of their day-to-day activities, such as reading, interviewing, teaching, writing, and seeking publication for what they have written, but I argue that these activities describe ancillary behaviors, and do not express what scholars actually do, or what it is about scholarship that motivates them. They are all descriptions, looking from the outside, of the behaviors researchers are involved in. But to what end is all of this? It is at least in large part to the end of communicating the findings of research. But even this does not describe the real role of intellectuals in society. Even this is an incomplete definition based on an external behavior. Could we not say that what academics really do is make a critical synthesis of previous scholars' work, and then either present an argument for what they have found, or conduct experiments to test the hypothesis?

The general findings of this study show that there definitely is a flow state that occurs in research, but that there is a pattern by which it occurs that indicates that the activities that most of us call "research" are really preliminary work to the real act of scholarship, or a communication of it

afterward. The real event of scholarship is a moment or period of insight in which a synthesis is made between all the media that the researcher has slogged through in his or her literature review, as well as with all the other material in his or her experience both in and out of their expertise. After this synthesis is made, the next step is another period of difficult work, whereby that very personal, intuitive, felt experience of making original connections among disparate data must be packaged into words, and then written or otherwise communicated in such a way that it may find acceptance in the academic community.

Avenues for further research

There are many different directions that this work could continue in. We have established that there is a definite pattern to the flow experience in expert researchers, but since this study only included five interview subjects within one school, it seems fair that more work could be done to determine how this pattern of slogging to make a synthesis, flow wherein the actual synthesis is made, and then slogging to communicate the synthesis, manifests itself among diverse populations, and how common it really is. Dimensions of diversity that could be considered include gender – how does the pattern manifest itself differently among women and men? Another important dimension to consider is what discipline the researcher is in. Is there a different pattern (or, as I hypothesize, a different conscious contextualization

of the same pattern) among humanists, social scientists, and natural

scientists? One of the advantages of this study was that it occurred in a

heterogeneous discipline – information science - where interview subjects

identified themselves as being closer to each of these three groups.

What could be gained from further research on this topic could be put

to use in the development of research methods courses for master's and PhD

students, not to mention professional development for academics, and

perhaps study resources for undergraduates or even high school students, all

of these be recalibrated to make the most of the pattern that we have

discussed here, so that research can be done not only more efficiently, but so

the sweetest creative nectar can be extracted and utilized as a reliable

resource, and not merely a stroke of luck that occurs at odd times.

Additionally, as is always said by those who have experienced flow, it is

enjoyable. The prospect of research being a consistently enjoyable experience

may be too rosy a hope for some academics, to be sure, but I believe that with

the right research on this topic, communicated clearly, research can be

elevated from a dreary, haphazard slogging with the odd moment of insight,

into a more productive and creative enterprise, where the researcher is very

much in touch with the joy of creation. I would argue that these are not

blessings that happen to be bestowed upon a fortunate few, but rather that

they are techniques that can be taught, and we have a need to teach them, not

merely to increase the production of academic research's quantity, but to

illuminate its refulgent, synthetic quality, as well. Of course, there will never be one standard set of behaviors or a single method to which all researchers will ever be bound, nor should there be, but the actual work of scholarship, by which I mean the synthesis of previous work, is something that is often left out, or minimized, in the conversation about how to be a scholar, when in reality these things can be communicated for the benefit not only of researchers, but for the public who look to them for their guidance and expertise, especially as the world compounds itself and accelerates, not only according to Moore's law, but a sort of Moore's law of violence that eerily follows it.

A system of providing creative answers is something that we have attempted with the process of research, and the existence of universities, in general, but there are more dimensions to it than syllogistic logic and the communication of that logic in papers and at conferences. There is a font of synthetic wisdom that we can draw on, and teach others to draw on, if we systematically explore how to make the best use of flow in the research process.

Qualitative Research Statement

Since I have conducted qualitative research, my personal biases and experiences were factors, even if they were subconsciously expressed, in how I interpreted the data that I found in the interviews. Someone else might find

other things in the interviews, so it would be rash of me to say, "these interviews clearly (or only) point to this conclusion." One factor that may play a role is my position as a Western, specifically an American researcher, which may mean that I have undoubtedly made assumptions about "how research is done" and what to look for, and how it is written about than may be found in other cultures. I can present the data with this caveat, but even then I may be missing significant data that I do not recognize as such. As a member of a privileged stratum of American society, I may assume that certain aspects of research are relatively simple, when for some other populations they may represent enormous challenges. A salient example, although there are many more subtle iterations of this phenomenon, is that there are many people in the world who do not have reliable access to the Internet, or that which is so slow for them as to be nearly useless, and so my assumption that if I can't find it in one database, I'll just open up another, is something that I, having access to these things and seldom experiencing interruptions to that access, take for granted. Since I take it for granted, when interviewees told me of strategies that they used in their research, I may have fallen into the trap of seeing them from my perspective of having easy access, and not factor in how much work and planning it represented for them. Thirdly, as a relative outsider – still being a student and having never been a professional researcher, certainly not for as many years as the interview subjects were, I may not recognize the magnitude of some of the points that

my interviewees are telling me. I may have underestimated their importance,

or, at the opposite end of the spectrum, I may have put too much stock in a

method that I heard one or two of my subjects talking about, which may skew

how I interpreted the data. The main challenge that I have tried to be aware

of in this regard was not in missing data, but in underestimating the

significance of some of the data that I collected.

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