




Ligature

Orville Mo-he

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## Introduction:

I was drowning in a sea of thoughts as I tried desperately to capture them word by word. I was writing about my creative practice, and what began as a paper for a writing class became self-reexamination through the lens of comparison against the protagonist of Dazai's existential and semi-autobiographical novel, *No Longer Human*. I fought desperately to get ideas and concept to page, but as I typed, a sense of restriction loomed over me. The relationships and connections between my ideas were fluid and intuitive. At the cognitive level, the understanding of one concept, its relationships, and the logical conclusions derived required the simultaneous understanding of all concepts, relationships, and conclusions. The flow of ideas, arguments, and concepts thus became a catch-22, and, within the linearity of the digital word processor, I could not verbalize my thoughts as any effort to verbalize and *textualize* my thoughts required that I do so in a manner that presented them in as logical and linear derivatives or tangents of one another. Such an effort lead to the inevitable forgetting of concepts as I tried to craft explicit verbal relationships between them. In that moment, I wondered why it is that the word processor presented me with so much trouble in establishing relationships between concepts, when, as an artist and designer, that is all I that do. I realized that I had no such issue when writing with pen on paper, which made me question, what it was about writing on the computer that felt *so unintuitive and limiting that it would hinder the act of writing itself*.

As I pursued the development of a more intuitive and flexible word processor as a project, I researched the various processes by which writing and thinking are undergone and how the current iterations of word processors have affect or accommodate for these processes. Though this research, I arrived at the conclusion that the reason current word processors feel limiting is the lack of the ability to explore alternate concepts and thoughts. This became the core focus of Ligature, a word processor designed to make writing feel natural even in the digital world.

## Contextual Discussion

### The Current State of Word Processing

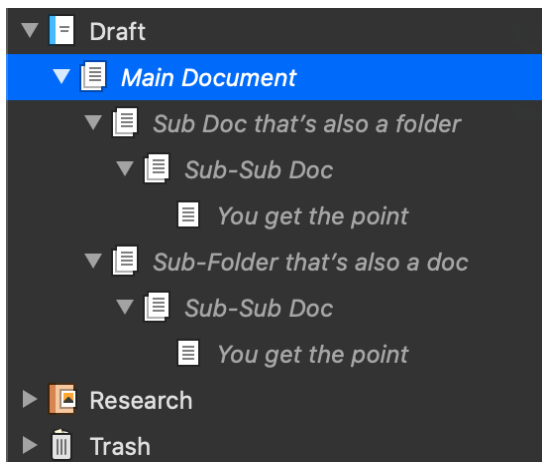
I began the project by analyzing the features and capabilities of current word processors in an effort to understand how they enabled or limited their users' ability to convey thought in text. What I found was that current word processors all feature speed formatting functions that allow users to quickly change the look and feel of the text they are working with. This helps differentiate between ideas and establish information hierarchy, however they all follow the linear archetype established by the early versions of Microsoft Word.

Microsoft Word, Google Docs and Apple Pages all strictly follow this archetype with little deviation making their approaches to writing the most "traditional" yet also the most basic. They allow users to fine tune everything from size and weight to spacing of their text. The process to do so, however, is tedious and forces users to put considerable time and effort towards differentiating between concepts. All three programs have also implemented quick formatting options whereby users can make a selection of text and choose a preset format. The problem here is that the two systems can at times counteract each other as when a user sets the heading of a section to non-default typeface and tries to make quick format it to be a heading in MS Word or Google Docs. The heading setting will override the user's changes and format the text back to the default typeface. Microsoft Word also makes it exceptionally hard to make changes to quick format presets.

Slightly less traditional is Bear, a primarily note-taking application that takes the alternative approach of markdown. Bear restricts type design to a few basic features; users are only able to change the size of text, typeface, and spacing for the entire body of text across all notes. This lack of customizability, however, is made up by markdown. Markdown essentially combines code with text, with the result being the ability to quickly format text by typing certain characters.

*\*I ate a sandwich\* = I ate a sandwich*

In Bear, users are able to type any number of hashtags followed by a space to indicate that that line of text is a heading, with the number of hashtags resembling the hierarchy; the larger the amount of hashtags, the lower it is in the hierarchy of headings. This allows users to quickly indicate a differentiation in text without ever having to stop typing.



Screenshot showing Scrivener File management menu  
Source: Orville Mo-He

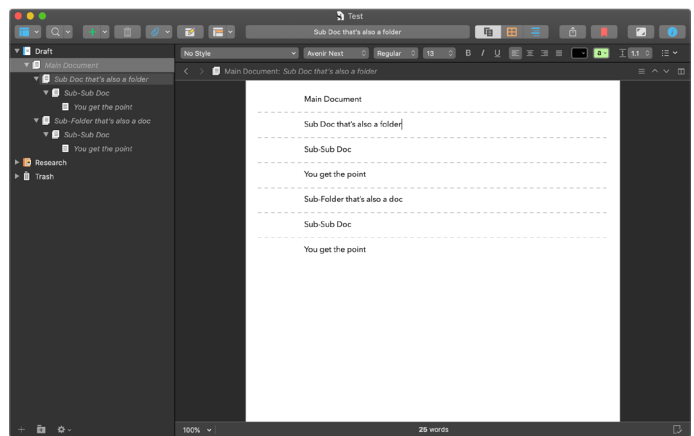


Image showing when "Scrivening Mode" is turned on. Source: Orville Mo-He

Finally, on the least traditional side of the spectrum of word processors, there is Scrivener, which treats the document as a "draft". In this draft, the user can make an endless amount of documents and folders, which the program basically treats as the same thing, within each document or folder, the user can create an endless amount of documents or folders. This embedding continues ad infinitum. The user is able to view any document or sub document in this draft, and when "Scrivening" mode is on, all subdocuments of that document or subdocument are compiled into one, in order of placement, and shown. This system allows users write in smaller pieces and explore thoughts and stories to their logical conclusion.

Despite the different features that help the user establish hierarchy, however, none of the apps allow users to write in a way that isn't restricted by the linearity, whereby text flows in horizontal lines that lie atop one another, forming a single vertical document. This approach of representing writing is far from the fluid (albeit messy) handwritten form, in which users can write anywhere they please and use any visual system or multiple systems to establish hierarchy and relationship. With pen and paper writers can break away from the main idea at any point write a note in the margins, or anywhere else, and draw an to where it applies.

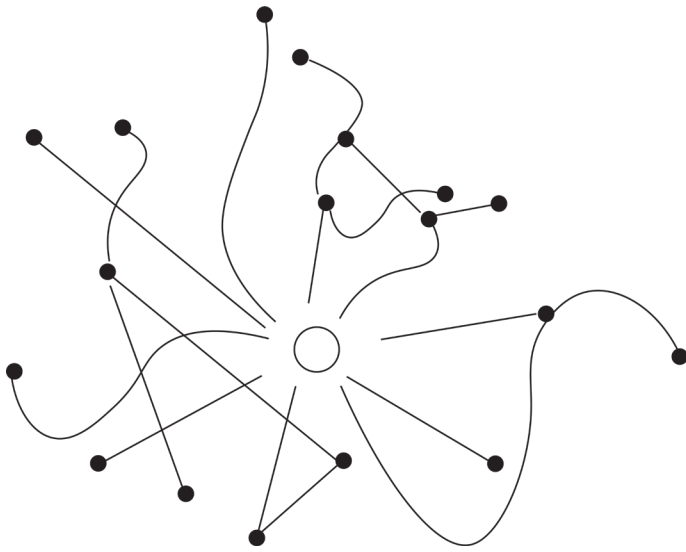


Image visualizing divergent thinking.  
Source: Orville Mo-He

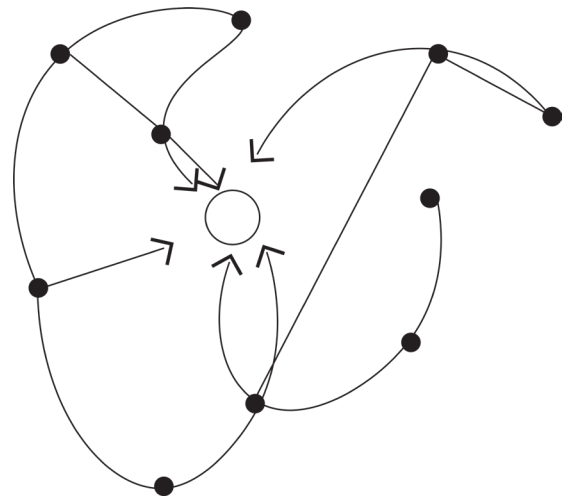


Image visualizing convergent thinking.  
Source: Orville Mo-He

## Creative Thinking

Since writing is essentially the textualization of thought, in which creativity is heavily reliant upon the processes of divergent and convergent thinking, the escape from linearity is especially important.

Todd Lubart and Herie De Vries, researchers at the Université Paris Descartes, explain in their 2017 paper, *Scientific Creativity: Divergent and Convergent Thinking and the Impact of Culture*, that within the scientific realm, scientific creativity is "any thought or behavior in science that is both novel and useful". They further explain that Scientific Creativity is broken down into two main processes: divergent and convergent thinking. Divergent thinking is the mental process by which vast quantities of unique solutions to a problem are created, and convergent thinking is the process by which information or solutions are synthesized and evaluated. In writing, divergent thinking becomes the process by and during which exploration occurs, while convergent thinking then becomes the process by which ideas are synthesized and interrelated.

## Writing Shitty First Drafts, Bird by Bird

The presence of these two modes of thought, which, at times, can be at odds with one another, has led the writers develop writing processes that specifically separate and maximize the two modes of thought.

In a joint interview via CreativeLive, Tim Ferris, a three times NYT Best-Seller, and his close friend and mentor Neil Strauss, a seven times best-seller, explained that they intentionally avoid outlines and structure in the traditional sense. Tim explains that he doesn't make any outlines before or during his writing process, instead he lists out every experience or thing he would like to try or test out, and this list becomes the closest he gets to outlining. Neil on the other hand never makes any kind of outline before writing because creating structure early in the process would only serve to lock them in and prevent truly ingenious ideas from forming.

They then rigidly structure their writing into phases of writing and editing, following the advice given by Anne Lamott in her book, *Bird by Bird*.

Lamott advises her students and readers to write short pieces that explore one moment, event, or occurrence to its fullest detail and logical conclusion and to write "shitty first drafts".

She explains that:

"The first draft is the child's draft, where you let it all pour out and then let it romp all over the place, knowing that no one is going to see it and that you can shape it later. You just let this childlike part of you channel whatever voices and visions come through and onto the page. No one is going to see it. If the kid wants to get into really sentimental, weepy, emotional territory, you let him. Just get it all down on paper, because there may be something great in those six crazy pages that you would never have gotten to by more rational, grown-up means."

Tim and Neil explain that this unadulterated exploration, without structure or rules, allows them to produce a large quantity of workable text. With this, they begin their rigorous editing phase where the text is sorted through and a massive amount of it is taken out or reworked in each pass of each draft. Neil explains that he does three passes per draft. The first is for himself, the second is for his fans, and the third is for his critics. Tim takes a similar approach.

Lamott's advice and Tim and Neil's writing processes reveal the "best practices" in writing is to segment and separate exploratory writing and editing, divergence and convergence respectively, with the exploratory divergence being controlled by Lamott's advice to conduct this based on a singular occurrence or detail, limiting horizontal exploration and incentivizing vertical exploration.

Coincidentally this structured approach towards writing eases the limitations imposed on the user by the linearity of current word processors as the separation of writing and editing helps the writer focus on the task, whether that be writing or editing. The short pieces of writing that focuses on a singular event or object also helps control the "direction" of divergence.

Through interviews with potential users and an observation session that was broken down into two parts (silent and semi-inquisitor), however, it is revealed that unless the user is an experienced writer, they would not have such an established and regimented writing process, and instead would work in more of a stream of consciousness manner as evidenced when during the observation session, the participant was seen staring at their keyboard for extended periods of time on multiple occasions. When asked about it, they replied that they were thinking about the best way to word something. They had been trying to write and edit at the same time, causing the disruption in their writing, despite knowing what they wanted to convey.

What's more is that even experienced writers, who have established writing processes, feel the limitations of the linearity of current word processors, as when Jennifer Metsker, writer and professor of writing at the Stamps School of Art and Design, explained the excruciating frustration she felt at times because of it, explaining that it just doesn't work for a primarily divergent thinker like her. When I surveyed a group of artists and designers whose writing was primarily acts of synthesis (convergence), it was revealed that, despite the purpose of the writing being a convergence of ideas, they tended to think divergently. This clash between the purpose of the writing and the tendencies of the writer explains Metsker's frustrations, as the same group also explained that they were primarily divergent thinkers as well.



# Creative Work

Ligature is a cross between traditional word processors and mind mapping software. Users write articles as they would in any word processor, except, in ligature, users can have a divergent train of thought, capture it seamlessly, and connect it back to the original idea. This allows for divergent thinkers to diverge freely without the linear constraints of traditional word processors, even when the purpose behind the writing is an explanation and synthesis of the writer's actions, past, philosophy, etc.

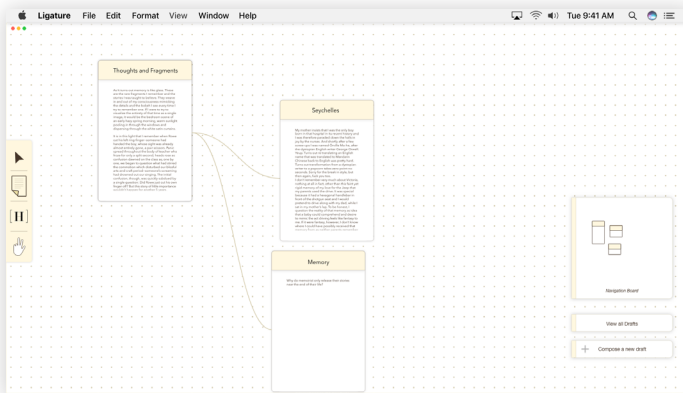


Image depicting the board and multiple trains of thought.  
Source: Orville Mo-He

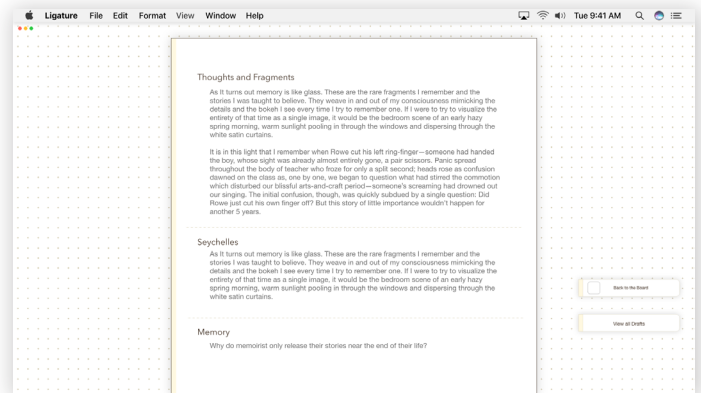


Image depicting the editor after a linear document has been compiled.  
Source: Orville Mo-He

The board allows for creation of headers that help users group and organize articles and media. Users can also link everything within the board to each other, allowing for users to more easily distinguish between when they want to diverge and converge—write and edit.

After the user has written everything they feel they need to Ligatures distinguishing feature comes to play; users are able to compile a new draft. A feature that lets users drag and drop any item on the board in any order, into a linear format, or draft, where users are able to further edit, revise, and finalize their writing. Users are able to reorder drafts that they have created. This system allows for users to converge and diverge at will, yet still keeping these processes separate—making writing digitally more fluid and intuitive.

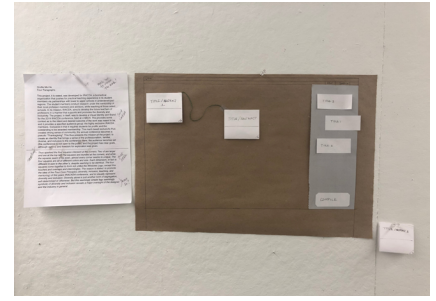
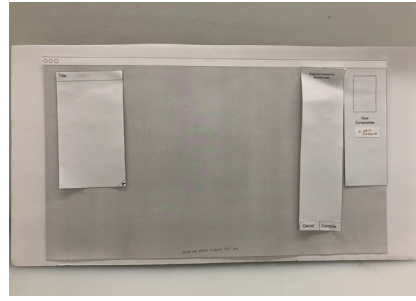
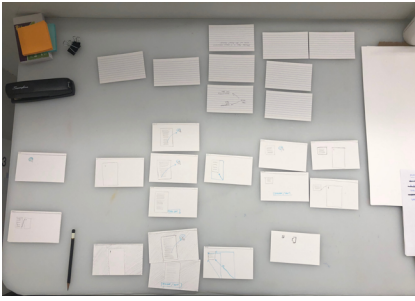
## Methodology

### Ethnographic Research

I conducted an initial wave of interviews at the same time as I conducted literary research. The first round of interviews helped me get an understanding of the writing processes of other people. I also analyzed the various writing applications/ word processors that are available; the features that they offer, and how those features affected the writing process.

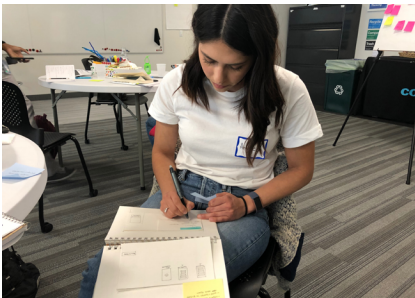
The second round of interviews involved much more selected participants. Participants were selected to represent a wide range of artists and designers—from various fields as well as various demographics, such as age, gender, and race/ethnicity. The second round was a total of 8 participants, which was limited by availability and time, although I do wish this was a much larger number.

My hunt statement, a statement or question that helped guide research, for both rounds was to get a better understanding of artists' and designers' writing and thinking processes and how that differed from professional writers. I studied artists and designers because they were a readily available demographic that also needed to do large amounts of writing, such as artist statements and personas. Artists and designers, however might not have the same comfort in writing or the practice and proficiency at writing. This difference, might therefore cause artists and designers to have an entirely different experience with writing on the computer. The same group that was interviewed also self-identified as people who thought mainly divergently even when writing. This lends them to become a sub-group representative of divergent thinkers in general, which allowed me to arrive at and tests hypothesis given the limited time and manpower.



**Above:** Images of the various paper prototypes.

Source: Orville Mo-He



**Above:** Image of Annette Rodriguez in usability testing session.

Source: Orville Mo-He



**Above:** Image of Kaili Dence in usability testing session.

Source: Orville Mo-He

## Prototyping and Usability Testing.

Users tending to think divergently even when it was a convergent task became my primary problem area to solve going into the prototyping and designing of Ligature, which resulted in the solution of letting users diverge at will.

I adopted the rapid prototyping approach, as explained by Lyndon Cerejo—to build low fidelity prototypes, prototypes that are quick to build and pay no attention to aesthetics, and conducting frequent usability tests to gather a lot of user feedback, which helped inform and support design decisions. I started with paper prototypes on index cards because creating these are fast and cheap. Low fidelity paper prototypes also offer the added benefit of preventing participants from focusing on details that don't yet matter, and instead focuses participant attention on the features and concepts being tested. At times feedback would be given (such as removing a certain element from the interface) and within seconds I would be able to adjust for and test the change.

Through this iterative process, I ran through 4 prototypes that each went through several iterations. Through usability testing, I learned that labeling (the naming of functions) was a major problem point of my project. To arrive at better labels, I conducted several informal interviews that ranged from asking participants what they associated with certain words or labels to asking participants to actively engage in brainstorming sessions.

Based on the feedback I received on my paper prototypes, and labels arrived at via informal interviews, I created horizontal prototypes whereby a lot of functionality is expressed or implied, however, not actually be built in. This allowed me to test and get feedback on a wide range of features and concepts, that were impractical to build due to time restraints and prototyping-software limitations.

## Conclusion

While I had originally planned to complete all the research and development for Ligature prior to coding and actual software development, this project quickly revealed itself to be a massive interaction design project which carries implications for both the project itself and my process as a designer.

Personally the project has reached its natural end. The developmental process of the project had become more of an exploration into the realms of interaction design, and, more importantly, research and data driven design rather than an effort to develop a word processor; the process had become more valuable than the intended outcome as it revealed to me the many areas in which my thinking and process were weaker or unclear and in need of improvement. It also served to reteach the many lessons that I had learned on paper, but couldn't grasp the scope of until I had actually made the mistake for myself. Through the process of developing Ligature, therefore, my thought and creative processes have been expanded and honed.

As a project, Ligature, despite its high fidelity, is in the concept testing stage, where a working prototype needs to be built and tested. Participants will be asked to evaluate its efficacy at improving intuitiveness and sense of freedom. The feedback then needs to be analyzed, synthesized, and implemented. Ligature would then be reevaluated to see if it had been properly recalibrated and then released with an iterative plan in place for constant and consistent updates for improvement. As it stands, however, Ligature is the concept of a truly intuitive and flexible word processor that helps users isolate the processes of exploration and synthesis and yet allows users to diverge and converge at will.



## Bibliography

- Cerejo, Lyndon. "Design Better And Faster With Rapid Prototyping." Smashing Magazine. Smashing Magazine, June 16, 2010. <https://www.smashingmagazine.com/2010/06/design-better-faster-with-rapid-prototyping/>.
- Lamott, Anne. Bird by Bird. New York, NY: Anchor Books, 1997.
- Tim Ferriss and Neil Strauss Talk Writing and Creativity on CreativeLive. Youtube. CreativeLive, 2013. <https://www.youtube.com/watch?v=2dTQWQXhSJU&t=2458s>.
- Vries, Herie B., and Todd I. Lubart. "Scientific Creativity: Divergent and Convergent Thinking and the Impact of Culture." The Journal of Creative Behavior 53, no. 2 (2017): 145-55. <https://doi.org/10.1002/jocb.184>.