Making Sense of (My) Traces: Practitioner and Researcher Perspectives on Trace Data

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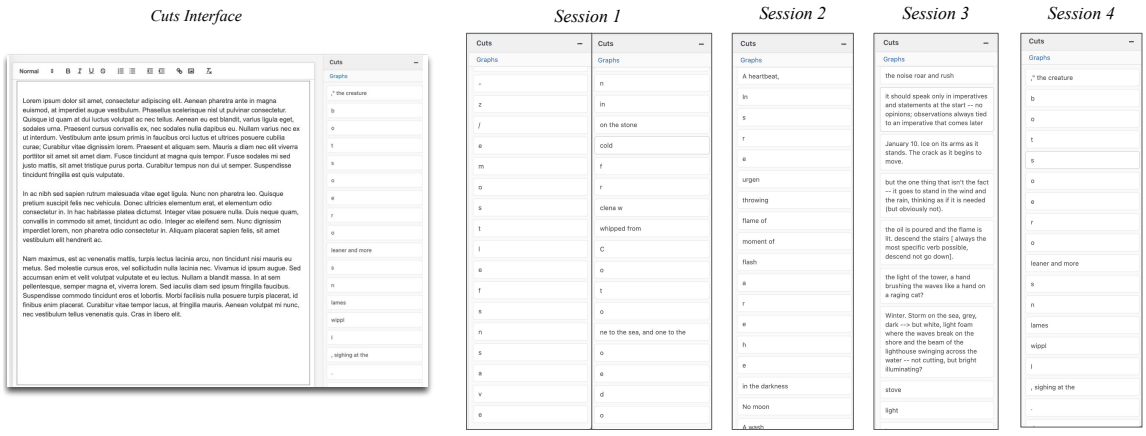

Fig. 1. *Left*: The Cuts interface UI (with placeholder text). When text is deleted in the editor, it immediately shows up in the Cuts log. *Right*: Examples of the Cuts log during each writing session.

CCS Concepts: • **Human-centered computing → Human computer interaction (HCI)**.

Additional Key Words and Phrases: Creative activity traces, creativity support tools, writing interfaces, process, reflection

1 Introduction

Activity trace data records the 'footprints' of a practitioner as they work with a digital tool (e.g. [7, 9]). Software systems can be instrumented to capture highly detailed logs – from version histories to keystroke-level interaction. Physical interaction also creates traces, in the scatter of tools on a workbench, sketches and test pieces taped to a wall, the way a notebook falls open to a particular page [10]. Each type of trace captures some fact about past action, whether a button clicked or a page turned.

Frequently researchers are interested in what these patterns tell us in aggregate, "data mining" activity traces to describe common patterns made up of the actions of creative work. These types of analysis can help us characterize the ways new tools are used [9], identify "stages" of creative process [6], or model behavior [1, 8]. Researchers also seek to design with creative activity traces to support individual users; representations of one's own traces can provide new interactions with tools [3] and mediate joint activities [2]. When we approach traces as practitioners, however, there is another layer to the relationship. One's own traces evoke more than the fact of the past action, but also context, intent, emotion, and reasoning from both the moment of their creation and the moments of their (re)-interpretation. They become part of one's creative process.

In this position paper, I interrogate a set of my own creative activity traces with two perspectives: that of the practitioner and that of the researcher. Through a log of text deletions, I reflect on how I make sense of my own traces and

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incorporate this data in my creative process, what research questions the data enables, and how these two perspectives combine to inform each other. I hope these reflections provide a springboard for other researcher/practitioners to turn a reflective lens on their own relationship to trace data and how this plays out in their research and practice.

2 Methods

2.1 The Tool

A common behavior among writers is to maintain a "graveyard" of deleted text from a draft, or to maintain old versions before a deletion, often as a way to avoid the pressure of a permanent deletion [5, 10, 11]. In my own writing, this is typically a separate text file called "cuts", into which I paste paragraphs, phrases, or even particular words that I am not happy with in the main text but which I am not ready to get rid of completely. Perhaps I will change my mind and want a phrase back, or reuse an idea later on in the piece. In some ways this "cuts" document is trace data in and of itself. However, as a probe into my relationship to trace data, I am interested in exploring what a more structured form of trace data might look like for these cuts. I hope to see how investigating this data can teach us about creative writing process (generally) and teach me about my writing process (personally). I therefore built a simple text editor in a web browser that keeps track of my cuts. When text is deleted from the editor, it is saved to a running list on the screen (Fig. 1), and to a text file with timestamps. It also can graph simple quantitative metrics of deletions (Fig. 2).

2.2 Data Collection

Using my Cuts tool, I wrote for about an hour and a half across four sessions. After each session, I took screenshots and notes of how I had used the Cuts tool, and reflected on how the traces spoke to my research interests and my own creative practice. I present the data below in the spirit of an autoethnographic inquiry.

2.3 Vignettes

Session 1 (30 minutes). In the first session, I am starting from a blank page, drafting a scene that focuses on establishing setting and tone, and experimenting with an internal voice for the point-of-view character. Writing with the Cuts panel open beside my editor is a different experience than my usual writing approach. First, it captures *all* my deletions, not just the ones I might choose to save in a separate file. As I frequently backspace to correct mis-typed letters, the panel fills with single characters. Most of these are typos, but I am also made aware of how frequently I choose words by writing a partial word, deleting it, starting a new one, deleting it, etc. These deletions might in order to pick the right sounding word, or to change the direction of the sentence. A few complete phrases appear in the log, places where I read back over a past paragraph and highlight a chunk to delete at once. Reflecting on the log, I think this is usually when a phrase strikes me as being cliche or out of place on the reread.

Session 2 (10 minutes). I've returned to the editor, and now I am re-reading what I have. As I read I edit phrases; the Cuts log grows with more phrase chunks and fewer single characters. I open the Graphs tab – perhaps I will see something in the timeline views? But these feel sterile, separated from the content of the writing.

Session 3 (20 minutes). I've written far enough that I can delete the outline notes I'd written at the start of Session 1. Now the notes appear in the Cuts panel, a reminder of the thoughts and plans I made before beginning, whether or not I stuck to them. The Cuts log continues to move and grow as I write; because of this, the editor feels more alive, more dynamic. I realize I usually look at the length of the page to see whether I've made any progress, but now I'm noticing

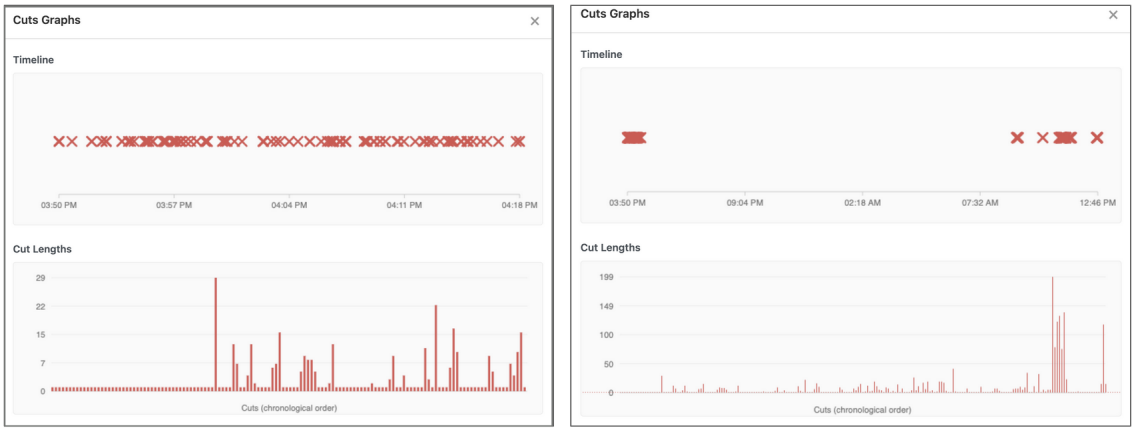

Fig. 2. Two snapshots of the deletion graphs; after the first session (left), and after the third session (right).

the movement of ideas from page to cuts. The notes moving over feels not like reducing my output, but transitioning their role.

Session 4 (25 minutes). I'm back to drafting, trying out a second character's perspective. Again, single letter deletions fill the log, but I also see single words or word fragments as I try to nail down this character's voice. The graphs look different now – I can see the multiple sessions, and the higher character count when I deleted my notes – but it doesn't spark any reflections.

Revisiting (5 minutes). I return now to the tool, my writing complete. The graphs intrigue me; why were the deletions so temporally dense in the early session, and so spread out later on? Is this a signal of drafting vs re-reading and editing? The lengths of the cuts spike in the middle – I know this was where I deleted the outline notes in big chunks. Could we combine timing and deletion sizes to help us determine when someone changes their goals or "stage" of writing? Looking at the cuts themselves, the individual characters feel like a problem; perhaps I should have used keystroke timing to group words together so that deleting *birds* character by character would show up as *birds*, and not as *s d r i b*.

3 Making Sense of My Traces

3.1 Two Perspectives

Practitioner: The traces of my deletions seem to be serving two purposes for myself as a writer. First, they heighten and focus my attention on this aspect of my writing process. Because of the intervention, I am attuned to the set of behaviors related to deletion, and I am ignoring others (e.g. the rhythm with which I pause and start again; when I stop writing to look up an archive of historical journals). I notice my exploration of word choices; I become painfully aware of how many typos I make. Second, the logs change my writing process. I begin to glance between the phrases I have deleted and the current text, monitoring the decisions I have made about voice and style, which words I have rejected, which keep returning. Here the traces are not "data", but rather operate more like a material in my writing process: shaped by my writing, and reciprocally speaking back to me about my writing. My writing *process* – both what I do and how I understand what I do – is evolving in response to this material, not just my writing *output*.

Researcher: In contrast, when I turn to the perspective of a researcher, I think about questions from a stance removed from the writing experience itself; for example, what types of behaviors are common, and what signals might indicate

reliable patterns. Now the traces are "data", separable from the experience that generated them. The graphs become meaningful, as a way to see temporal patterns and suggest what I might do with similar records of a hundred writers' deletions. I also being to think about how to improve the tool. What does the tool seek to do, and how would I measure success? As a probe into my own process, this tool was not designed to have a specific effect – not to make my writing better, or faster, or cleaner. What came out of my experience with it as a practitioner was the opportunity to make new sense of my actions by interpreting the traces within my writing practices. But as a designer and a researcher, it offers me ideas for how to design for specific outcomes, to turn the personal effects into generalizable goals.

3.2 Discussion Questions

From this experience, I'd like to suggest the following questions for us as researcher/practitioners to discuss and consider in our work with creative activity traces.

When are traces data? To become data implies a separation from the source experience. Aggregating data across many individuals allows us to mine for patterns, but loses much of the context and meaning the data had for the creator. When are traces a *material*[1], and when are they *data*? What claims or interactions would require traces to remain situated? As researcher/practitioners, how do we treat our own traces in our work, and how do we use others'? By engaging with our own research tools as practitioners, we may uncover for ourselves unexpected dynamics and subtleties in our trace data.

Who are traces for? As researchers, sometimes we collect trace data on the "back end", either to aggregate in the future or to selectively display back to the practitioner. When we make traces directly available to the practitioner – as in the example here – they are then re-engaged in the creative work, changing the very process that the researcher might want to observe. How can activity traces help researchers understand general patterns, while at the same time being specific and situated enough for practitioners to meaningfully engage with their own work? Are these complementary goals, or are the assumptions of the role of the traces so distinct as to require separate designs and studies?

What do we mean by creative process? We hope that creative activity traces help us understand creative process. But what understandings of creative process are enabled or hidden by trace data analysis? What do these models of creative process provide to researchers and practitioners?

4 Conclusion

Creative activity traces are an exciting resource through which to look at creative process. As we do so, let us look both from our perspectives as researchers, and our perspectives as creative practitioners, staying attuned to creative process as a dynamic relationship between practitioner and practice.

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