

9-1-2021

Acting with Inscriptions: Expanding Perspectives of Writing, Learning, and Becoming

Kevin R. Roozen

University of Central Florida, Kevin.Roozen@ucf.edu

Follow this and additional works at: <https://trace.tennessee.edu/jaepl>



Part of the [Creative Writing Commons](#), [Curriculum and Instruction Commons](#), [Curriculum and Social Inquiry Commons](#), [Disability and Equity in Education Commons](#), [Educational Methods Commons](#), [Educational Psychology Commons](#), [English Language and Literature Commons](#), [Instructional Media Design Commons](#), [Liberal Studies Commons](#), [Other Education Commons](#), [Special Education and Teaching Commons](#), and the [Teacher Education and Professional Development Commons](#)

Recommended Citation

Roozen, Kevin R. (2021) "Acting with Inscriptions: Expanding Perspectives of Writing, Learning, and Becoming," *The Journal of the Assembly for Expanded Perspectives on Learning*: Vol. 26 , Article 5.

<https://doi.org/10.7290/jaepl26va13>

Available at: <https://trace.tennessee.edu/jaepl/vol26/iss1/5>

This article is brought to you freely and openly by Volunteer, Open-access, Library-hosted Journals (VOL Journals), published in partnership with The University of Tennessee (UT) University Libraries. This article has been accepted for inclusion in The Journal of the Assembly for Expanded Perspectives on Learning by an authorized editor. For more information, please visit <https://trace.tennessee.edu/jaepl>.

Acting with Inscriptions: Expanding Perspectives of Writing, Learning, and Becoming

Kevin Roozen

Abstract: *This article argues for increased attention to people's engagements with inscriptions and inscriptional practices and the long-term implications they have for the ongoing production of persons, practices, and social worlds across heterogeneous times, places, and activities. Based on a multi-year case study, this analysis examines one microbiology major's production and use of inscriptions at the intersections of his participation in both disciplinary science and religious worship and traces the long-term consequences those uses have for his becoming as a scientist of faith. If, as Paul Prior asserts, "literate activity is not located in acts of reading and writing but as cultural forms of life saturated with textuality, that is strongly motivated and mediated by texts," then we need to take seriously the full range of semiotic textualities and texts implicated in people's lives and their roles in people's meaning-making and becoming.*

In "Fuzzy Genres and Community Identities: The Case of Architecture Students' Sketchbooks," Peter Medway examines the functions that keeping and using sketchbooks play in the development of these students' ways of knowing and being. Borrowing from Bruno Latour and Steve Woolgar's notion of "inscriptions,"¹ a term they em-

1. In a footnote to chapter 2 of *Laboratory Life*, Latour and Woolgar state that their notion of "inscriptions" comes from Derrida, who used the term in reference to material representations "more basic than writing" (88). Latour and Woolgar use "inscriptions" to distinguish "all traces, spots, points, histograms, recorded numbers, spectra, peaks, and so on" that animate the work they observed in scientific laboratories (88) from the traditional kinds of published textual products, such as scientific articles and books, typically referred to as "writing." Other examples of inscriptions Latour and Woolgar offer throughout their book include "hastily drawn diagrams" (47), and "material dictionaries" such as "racks of samples, each of which bears a label with a 10-digit code number" and "files full of data sheets" (48), and "photographs" (88). In "The Role of Representations in Engineering Practices: Taking a Turn Toward Inscriptions," Aditya Johri, Wolff-Michael Roth, and Barbara Olds, use "inscription" as a term that "covers everything that is used to refer to some thing or phenomenon in the material world, including photographs, naturalistic drawings, diagrams, graphs, tables, lists, and equations" (8). In *Mind as Action*, James Wertsch offers a list of semiotic means that Vygotsky mentioned in his scholarship, including "various systems of counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps and mechanical drawings," all of which Wertsch notes would be considered as material inscriptions in the sense that "they are physical objects that can be touched and manipulated. Furthermore, they can continue to exist as physical objects even when incorporated into the flow of action" (30). Writing

ploy in referring to the wide variety of material representations—from written alphabetic annotations to photographs, drawings, diagrams, charts, tables, lists, graphs, equations, instrument readings, and more—employed in scientists’ meaning-making, Medway uses the term “inscriptional semiotic modes” (125) to describe the promiscuous blendings of handwritten alphabetic prose, drawings, diagrams, numbers, markings, and objects that texture the pages of architecture students’ sketchbooks. Noting that such semiotic ensembles “do not fall neatly within a narrow definition of ‘writing research’ because they make use of other semiotic media as well, sometimes to the near exclusion of writing” (128), Medway says that people’s engagements with such texts have gone largely unexamined in writing studies scholarship and suggests that researchers “need to move away from ‘writing’ as the focus of our studies and to acknowledge the importance of texts that are multimodal” (128).

Medway’s chapter offers just one in a long history of calls for writing researchers to address the broad expanse of semiotic means that shape people’s textual practices of meaning-making. Emerging from the 1966 Dartmouth conference, John Dixon’s *Growth in English*, published in 1967, forwards an argument for resisting perspectives that offer “partial and incomplete view[s]” and “dangerous simplification[s]” (1) of the richness and variety of writing in people’s lives. Challenging reductive views, Dixon argues for a more capacious perspective of ‘writing’ that could encompass a boy’s diary entry about catching newts in a pond, a young girl’s drawings and accompanying poem about a kitten, the diagrams and sketches involved in activities such as “a group of boys designing and making something like a go-kart” (67), the prose description generated by a young girl observing flower petals under a microscope, and the moving images and sounds of television programs and films. Twenty-five years later, in “Context, Text, Intertext: Toward a Constructivist Semiotic of Writing” Stephen Witte identifies the need for “a conceptualization of writing that is predicated on broader and ... more realistic understandings of text and writing than have generally informed writing research to date” (238). Based on his review of writing research up to the two decades preceding 1992, Witte argues that

Although traditional language, whether spoken or recorded in print, is clearly an important component in many meaning-making activities we have come to associate with the production and comprehension of traditional alphabetic text, attending only to traditional language will not permit us to account for either the production or use of many “written texts” we all encounter on a daily

Studies scholars might be more familiar with other kinds of texts addressed in writing studies scholarship that would be included under the broad category of inscriptions. In addition to the pages of the sketchbook pages examined by Peter Medway and the other examples I mention throughout this article, those texts would include the drawings on the calendar crafted by one of the students in Elizabeth Chiseri-Strater’s *Academic Literacies*, the baseball cards used by Mary Louise Pratt’s son and the manuscript by Guaman Poma discussed in “Arts of the Contact Zone,” and the gang graffiti and posters on the boy’s bedroom wall examined by Ralph Cintron in *Angels Town*. More recently, in “Who Has the Right to Write? Custodian Writing and White Property in the *University*,” Calley Moratta addresses the tattoos of custodial employees.

basis—labels on cereal boxes, traffic signs, telephone book yellow pages, the operating manuals in the glove compartments of new automobiles ...—all of which rely on non-linguistic sign systems. (240)

Ultimately, Witte asserts, a comprehensive framework for a viable understanding of writing would need to recognize that “to study writing is, over and above all else, to study acts of making meaning that are mediated through ‘texts.’ ‘Texts’ may be defined broadly as organized sets of symbols or signs” (237).

Twenty-five years after Witte’s article, and fifty years after Dixon’s book, Paul Prior notes in his 2017 *Research in the Teaching of English* forum response titled “Setting a Research Agenda for Lifespan Writing Development: The Long View from Where?” that despite the long history of calls for attention to the broader semiotic and multimodal dimensions of people’s textual acting in the world, including Witte’s, a focus on “just-writing,” a term Prior uses to describe the emphasis on written alphabetic prose as the privileged semiotic mode, “continues to be the most common unit of analysis in research.” As a corrective, Prior argues for an approach that takes “embodied, mediated, dialogic, semiotic practice as the basic unit of analysis” (215) in order to address people’s efforts at meaning-making in ways that can include interweavings of semiotic performance across a wide array of modalities, including visual representations, bodily gesture and movement, musical expression, and mathematical calculation. Prior’s argument for understanding and studying writing as embodied semiotic practice extends his earlier assertion in *Writing/Disciplinarity* for taking “literate activity,” which he defines as “cultural forms of life saturated with textuality, that [are] strongly motivated and mediated by texts” (138) as a productive unit of analysis for examining people’s concrete textual engagements in the world.

In the years since Prior’s response, calls for increasingly capacious perspectives of writing have continued to texture writing studies scholarship. In *Queer Literacies: Discourses and Discontents*, published in 2019, Mark McBeth’s examination of the broad range of literacy archives and artifacts Queer people have used to reshape their discursive and material selves and worlds reveals the wealth and variety of textualities—from crayon drawings to medical texts to making and marching with picket signs—that have been central to their efforts to “reinscribe themselves into the historical memory of culture and society” (233). In “Becoming Multilingual Writers through Translation,” published in 2020, Xiqiao Wang’s close, careful analysis of the translation practices of one transnational and multilingual undergraduate illuminates the lengthy and complex chains of multiple languages, digital tools, cultural narratives, rhetorical traditions, and learning trajectories that are continually woven, unwoven, and rewoven together across multiple semiotic repertoires.

This article echoes and extends writing studies’ long history of calls for more capacious notions of the texts and textual practices that animate people’s lives and actions. Based on data collected from a multi-year longitudinal case study of one writer throughout his college years (as well as recollections and artifacts from his early childhood), this analysis traces this student’s engagement with inscriptions, specifically the diagrams that animate his science courses (see Figure 1 as an example), and the enduring consequences acting with inscriptions holds for his development as a scientist-in-the-making.

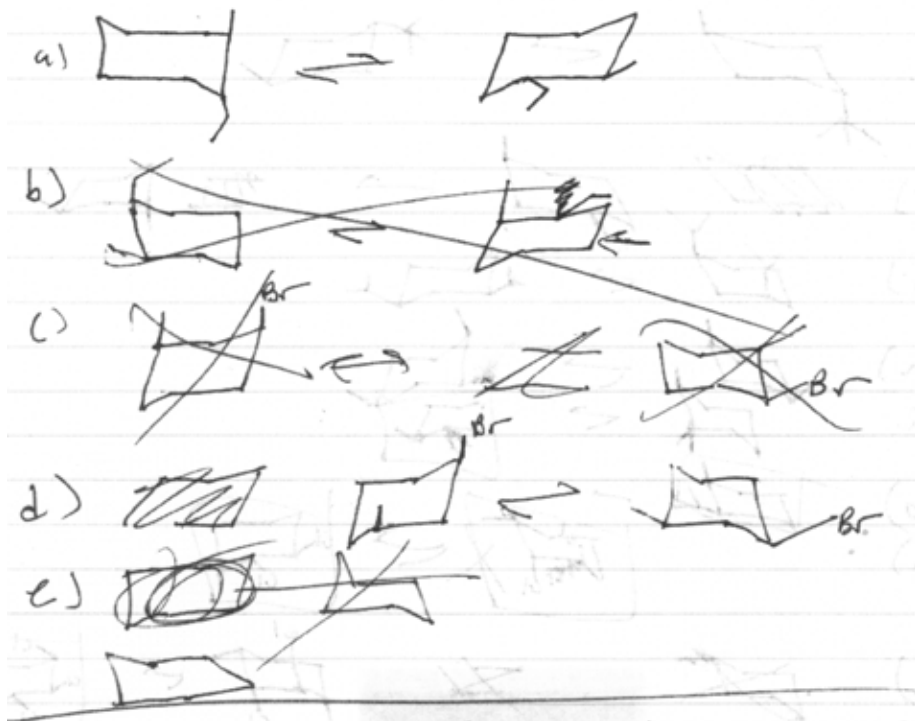


Fig. 1 An excerpt from a page of Samuel's organic chemistry notebook showing his efforts to graphically represent organic molecules. The representations depicted are chair conformation diagrams of cyclohexane molecules.

During the time of our research together, Samuel, a Black (his chosen term) undergraduate at a large public university in the southeast, was a microbiology major considering a career in veterinary medicine. As an undergraduate, his experience was initially textured by the tension he felt between his intense interest in science and his long history of engagement with religious worship. According to Samuel, his fascination with science began with the inquisitive nature he displayed as a child. As he described it, "growing up I always had a love for animals and I was always the thinker, always asked a bunch of questions." He noted, though, that "growing up in the area I grew up in, it wasn't cool to really pursue that, so like in my science classes, I really wasn't that interested in that." Through his volunteer work with a pet care center and his experiences in labs for his high school science classes, Samuel grew increasingly drawn to "just finding out how something works at the atomic level and molecular level and cellular and the tissue, organs, developing into the organism and how all of that works." By the middle of high school, Samuel indicated that he "just fell in love with biology. I was able to immerse myself in it. And I'm like, 'I'm really good at this'." His experiences with animals eventually drew him toward college and veterinary medicine.

The one thing that gave Samuel serious pause about a career in science was its potential impact on his deep engagement with the church, a vital part of his upbringing and family life. Members of Samuel's family were active in the Black Presbyterian church they have attended for generations. Both of his parents held positions in the church leadership, and Samuel and his brother had been involved with church activities since their early childhood. Recalling the tension he felt about maintaining his faith and presence in the church as his budding interest in science grew, Samuel stated,

When I first started really pursuing science, I had trouble trying to see science and God in the same vein because of the way our culture works. We see them as two polarized, very opposite entities, that you can't pursue knowledge of the world or try to understand creation and God himself.... All of the people that I would talk to would be like either, "Yes! Science is the answer, science is the way, science gives me all of the answers that I could ever possibly need to know." And then others were like, "No, science is not this. You can't believe that all of this makes sense."

Faced with the dichotomy offered by this powerful cultural narrative, Samuel considered forsaking his interest in science for what he described as a "steady job" that would allow him to stay actively involved in his church. At the point Samuel started college, he shifted his stance, reconciling himself to keeping his religious engagement fairly private while pursuing his goal to become a vet. In this article, I argue that acting with inscriptions offers Samuel ways of knowing and being in the world that productively entangle his science and religious experiences, and that these interweavings have had long-term implications for his becoming as a scientist of faith.

Looking with Literate Activity

To gain some purchase on Samuel's engagement with the inscriptions he encountered in his science coursework, I take up Prior's invitation to attend to "literate activity." Drawing upon theoretical perspectives that posit human activity as mediated by people acting with semiotic tools in situated moments and along historical chains of action (Bakhtin; Wertsch, *Voices*; Voloshinov; Vygotsky), in *Writing/Disciplinarity* Prior proposes literate activity as a unit of analysis that could better account for the many cultural tools, practices, actors (humans and non-humans), and activities dispersed throughout the lengthy histories that come to be entangled in people's textual engagements typically referred to as "writing" and "reading." Defining literate activity "not as located in acts of reading and writing, but as cultural forms of life saturated with textuality, that is strongly motivated and mediated by texts" (138), Prior's use of the terms "textualities" and "texts" explicitly signals the incredible diversity of material and cultural practices that mediate communicative action, including those offered among the many examples of "written inscriptions" listed by Prior and Charles Bazerman in their introductory chapter to *What Writing Does and How It Does It*. These examples range from "a name carved into a stone monument or into a tree" to "an animated banner running across a Web page" to "an income tax form" (Bazerman and Prior 7). Those terms also speak to how "communicative practices are multimodal—with talk, text, bodily stance and gesture, graphics,

mathematics, and other symbolic activity woven together through interactional history” (Prior, *Writing/Disciplinarity* 70). The attention to the broad multimodality of texts people act with is reiterated in Prior and Jody Shipka’s “Chronotopic Lamination: Tracing the Contours of Literate Activity,” where they write that literate activity “is about representational practices, complex, multifarious chains of transformations in and across representational states and media” (181-182). Literate activity, then, provides a way to move beyond reductive conceptions of the kinds of texts typically associated with “writing” and “reading” in order to more fully address the broad array of inscriptions, regardless of semiotic modality, implicated in people’s representational practices, the incredible variety of inscriptions that people act with.² As a construct for understanding and studying writing, literate activity works to resist arbitrarily reducing people’s efforts at meaning-making solely in terms of their engagement with a narrow range of texts that privilege a particular semiotic mode.

Situated studies of writing have productively taken up a literate activity perspective to examine people’s semiotic performances with the variety of material texts, including notations, diagrams, puzzles, and games that are linked into the invention and production of academic publications (Durst; Prior, *Writing/Disciplinarity*; Prior and Shipka; Roozen, “Coming to Act”; Shipka); patient documents, medical and everyday illustrations, and visual images used to understand and monitor physical health (Bellwoar); blendings of visual images and prose employed in social media postings (Buck; Wang); drawings, both print and digital, for participating in fan activities (Fraiberg, “Pretty Bullets”; Roozen, “Fan fic-ing”); the blendings of visual images and multiple languages, both spoken and written, animating workplace meetings (Fraiberg, “Composition 2.0”); and the interweaving of diagrams, images, objects, and gestures used in designing a computer interface for an interactive website (Prior, “ReMaking IO”; “Writing”).

Because of its focus on people’s concrete experiences with specific semiotic tools, the lens of literate activity helps us understand how people, acts, and objects come to be entangled in and across heterogeneous activities. To conceptualize the way literate acts come to be textured by an accumulated and ever-accumulating heterogeneity and heterochronicity of social action, Prior draws upon Erving Goffman’s notion of lamination—the way multiple, heterogeneous social frames and footings are dynamically and agentively woven into moments of action; how multiple activities co-exist, are immanent, in any situation. Rather than separate layers of thin veneer, lamination conceptualizes such interweavings as densely entangled and interanimating. In this sense, a literate activity perspective makes visible how people’s engagement with a particular text, according to Prior, is “not only multimodal, but also temporally and spatially dispersed and distributed across multiple persons, artifacts, and sites” (*Writing/Disciplinarity* 137). Each moment of textual action, Prior notes, “implicates multiple activities, weaves together histories, and exists within the ... networks of lifeworlds where boundaries of time and

2. For Prior, the term “act with” (“Sociocultural” 55) highlights an explicit recognition that action is accomplished by people acting with cultural tools. In examining people’s literate activities, “act with” also serves as a way of explicitly signaling the many ways people interact with texts that can be easily obscured by terms such as “writing” and “reading.”

space are highly permeable" (277). Prior and Shipka define the laminated character of literate activity as "the dispersed, fluid chains of places, times, people, and artifacts that come to be tied together in trajectories of literate action along with the ways multiple activity footings are held and managed" (181), and offer a number of analyses that illuminate how people's uses of texts and artifacts are simultaneously linked into multiple, seemingly disparate activities, including, for example, how domestic activities such as doing family laundry and leisure pursuits such as playing board games and puzzles are connected to the invention and production of disciplinary writing. This tangling of textual engagements across heterogeneous activities, Prior and Shipka contend, is a central way that literate activity functions for people to "not only inhabit made-worlds, but constantly make our worlds—the ways we select from, (re)structure, fiddle with, and transform the material and social worlds we inhabit" (182).

According to Prior and Shipka, this laminated quality arises from the fact that multiple activities are "co-genetic," or "co-developing," that elements from one domain are "always developing in association with other activities, actions, and artifacts" (207) no matter how different or disconnected those activities might seem. A literate activity perspective, then, invites consideration of the ways any focal activity develops in conjunction with, rather than apart from, other activities. This co-development of activities, and of people and the semiotic tools they act with, creates what Prior refers to as "affordances for alignment" (*Writing/Disciplinarity* 277), conditions which can occasion further agentive entanglings of social worlds and people's histories with them. In this sense, literate activity alerts us to how people's textualities emerge from heterogeneously textured lifeworlds and how those lifeworlds are continually woven together, unwoven, and rewoven again throughout people's lifespans.

With regard to how people come to act with texts in the world, then, a focus on literate activity highlights the wide array of semiotic tools people act with (e.g., spoken and written languages, images, gesture, embodied performance), both as they are combined and coordinated within emerging moments of situated action and chained together across time and space. It also illuminates how people and the semiotic artifacts they act with are continually being heterogeneously entangled with new elements for new purposes. In "How Do Moments Add up to Lives?" Prior argues that these features of literate activity are central for understanding what he refers to as people's "trajectories of semiotic becoming," the continually emergent, richly embodied, complexly mediated, and heterogeneously dispersed pathways of development people trace throughout their lifespans and across their lifeworlds. In contrast to narrow, static models of development that cast learning and socialization in terms of people's use of any single semiotic modality and in any single homogeneous social world, Prior writes that "Becoming happens in spaces that are never pure or settled, where discourses and knowledge are necessarily heterogeneous, and where multiple semiotic resources are so deeply entangled that distinct modes simply don't make sense" (Introduction). For Prior, the heterogeneously textured artifacts, practices, and identities that are assembled in laminated moments of "intra-action" (Barad 33) function as the resources for meaning, agency, and action that people build from in later moments in the near and distant futures.

Methods

When my study with Samuel began, he had just started his second year of college. I first came to know him as a student in a class I was teaching. During that semester, Samuel indicated that he was a microbiology major immersed in a wealth of literate activity for his science coursework. The following semester, I invited him to participate in a research study to understand the textual practices he was using. As the research moved forward, Samuel took up the role of “co-researcher” (Ivanic 110) in the sense that, understanding the goals of the study, he brought new data in to interviews, suggested topics of discussion, offered his own insights, and responded constructively and critically to my emerging understandings. Initially, I collected sample texts from and conducted text-based interviews regarding his classes. During our early interviews, Samuel often mentioned his religious faith (e.g., his knowledge of the Bible, his parents’ roles in the church they attended) and his activities associated with religious worship (e.g., attending church services, studying and memorizing religious texts, singing religious songs). Because I sensed that his faith and these related activities were important to him, and because such faith-based activities also figured prominently in my own history, both as part of my family life and throughout extended periods of my K-12 schooling, these subjects became something we talked about during our interviews.

Subsequent interviews led to more focused examinations of Samuel’s practices, and included collection of sample texts in whatever representational media were appropriate (e.g., hard copy and digital inscriptions). Collecting sample texts was crucial for process- and practice-based interviews focused on making visible how and why Samuel created and used specific texts. Process-based interviews involved having Samuel create retrospective accounts (often supported by texts and other artifacts) of the processes involved in the invention, production, and circulation of a particular text (e.g., the current draft of one of Samuel’s chemistry lab reports), and key elements (e.g., other people or texts, inscriptional tools and technologies) involved in those processes. Practice-based interviews aimed at understanding why and how such elements were employed.

In all, we conducted eight formal interviews, which resulted in just over 14 hours of video and audiotape data. I supplemented the formal interviews with dozens of follow-up questions developed while I examined the interview recordings, my notes, and texts that Samuel provided. I emailed these follow-up questions to Samuel after the formal interviews, and he either emailed his responses, brought them up during later formal interviews, or mentioned them during informal conversations when he stopped by my office or during chance meetings on campus. This ongoing series of interviews provided opportunities for the kinds of “longer conversations” and “cyclical dialogue around texts over a period of time” that Theresa Lillis (362) identified as crucial for understanding literate practice within the context of a participant’s history. They also allowed for what Amy Stornaiuolo, Anna Smith, and Nathan Phillips describe as “the unprecedented, surprising, and meaningful to emerge in observations of human activity without predetermined and text-centric endpoints of explanations” (78). One insight that slowly emerged from our series of conversations and exchanges was Samuel’s frequent use of diagrams and other inscriptions and their prominent importance in his science coursework as well as his other textual engagements. In terms of his science coursework, for

example, I noticed how fully he was immersed in an extensive cascade of inscriptions for his biology and chemistry classes and labs. I also noticed how frequently talk about diagrams and other inscriptions related to his various science courses emerged during our interviews, and how frequently during our discussions he would draw out the diagrams he mentioned and how quickly he generated them as a form of what Laurence Musgrove and Myra Musgrove describe, via their own graphic illustration, as “handmade thinking” people use to “to understand and to be understood” (92). Because of my own experiences taking science courses in primary and secondary school, and then briefly pursuing a biology major and working for a short time as a lab assistant in a microbiology lab during college, these inscriptions became topics of discussion during our interviews.

In order to focus on Samuel’s engagement with diagrams, I oriented my analysis toward the histories of his use of inscriptions and inscriptional practices. I analyzed these data interpretively and holistically (Durst; Miller, Hengst, and Wang; Prior, *Writing/Disciplinarity*). I first arranged data representations (i.e., sample texts, sections of interview transcripts, interpretive notes, copies of images, printed versions of still images captured from video, drawings Samuel had created during interviews, etc.) chronologically in the order in which Samuel engaged with them throughout his lifespan. Those data representations were examined for instances where I sensed, or Samuel indicated that, he was acting with particular inscriptions or employing particular inscriptional practices.

This analysis of the data generated a number of histories, what Catherine Kell refers to as “meaning-making trajectories” (“Making”; “Literacy”; see also Bellwoar) that stretched across seemingly different literate activities throughout Samuel’s life. Based on those histories, I constructed brief initial narratives of his use of particular inscriptions across multiple engagements. Those initial narratives were reviewed and modified by checking and re-checking those constructions against the data representations (to ensure accuracy and seek counter instances) and by submitting them to Samuel for his examination. At these times I often requested additional texts from Samuel, and frequently he volunteered to provide additional materials and insights that he thought might be useful in further elaborating and extending the narratives. Frequently my understanding of Samuel’s use of inscriptions for different literate activities needed significant modification as a result of closer inspection of the data, identification of additional relevant data, or discussions with Samuel during interviews or via email. Accounts of these interactions were modified according to Samuel’s feedback. Finally, Samuel was invited to member check final versions of the narratives in order to determine if they seemed valid from his perspective.

Samuel’s Acting with Inscriptions

As a sophomore microbiology major with a career goal of veterinary medicine, Samuel found himself deeply immersed in a dense landscape of inscriptions. Samuel’s lectures, textbooks, and notes for his initial chemistry courses, for example, were saturated with diagrams, especially the various diagrams of molecules that his professors drew on the whiteboard and that he himself drew in his lecture notebook and for his homework assignments and exams. Articulating the centrality of inscriptions as the locus of the

scientific enterprise, Latour writes, “Scientists start seeing something once they stop looking at nature and look exclusively and obsessively at prints and flat inscriptions” (39). What might seem like errant doodles or a simplistic shorthand are, as Latour states, “innovations in graphism” (29) that are key semiotic tools in “the precise practice and craftsmanship of knowing” (21) for chemistry. Discussing the importance of these diagrams for the development of disciplinary practice for chemistry, Latour writes,

The manipulation of substances in gallipots and alambics becomes chemistry only when all the substances can be written in a homogeneous language where everything is simultaneously presented to the eye. The writing of words inside a classification are not enough. Chemistry becomes powerful only when a visual vocabulary is invented that replaces the manipulations by calculation and formulas. Chemical structure can be drawn, composed, broken apart on paper, like music or arithmetic, all the way to Mendelev’s table. (36)

According to Latour, acting with these inscriptions, coming to interpret them, name them, generate them, see them, is essentially the work of a chemist, and learning how to create and see with these inscriptions is a key part of Samuel’s rhetorical education as a scientist-in-the-making.

Drawing diagrams played an especially important role in Samuel’s organic chemistry class. From the very beginning of the course, much of the activity centered around acting with a variety of molecular diagrams, bare-bones depictions that “present to the eye” a molecule’s key relevant features and its spatial arrangement and allow molecules to be “drawn, composed” and “broken apart on paper,” like the ones shown on the page from Samuel’s organic chemistry notebook offered in Figure 2.

Describing the kinds of “interpretive journeys”³ involving these inscriptions that his professor would offer during class lectures, for example, Samuel indicated that she

doesn’t write too, too much on the board unless it’s drawing a structure.... Like a Newman projection, she’ll draw that on the board. Like an organic structure she may draw on the board and then talk about chirality of a compound. 2-bromobutane [pointing to the diagram at the top right of the page from his

3. In their article “Interpretive Journeys: How Physicists Talk and Travel through Graphical Space,” Elinor Ochs, Sally Jacoby, and Patrick Gonzalez use the term “interpretive journey” to describe scientists’ common practice of drawing an inscription on a surface such as a chalkboard, and then animating that inscription with their talk and gestures. It is through this practice, the authors note, that “scientists take seemingly immutable inscriptions ... and over narrative time, transform them into highly mutable, highly intertextual and symbolic narrative spaces through which they verbally, gesturally, and graphically journey” (158). I employ this term as a way of helping readers to keep in mind that in the lectures he attends, Samuel is not just encountering, and acting with, an inert inscription that his professors draw on a whiteboard. Rather, Samuel is encountering an inscription as it is linked into his professor’s talk, gestures, gaze, bodily stance, and likely to other inscriptions that have also been drawn on the board, as well as those that have been recently erased during the class meeting, and those offered in the textbook and other course materials.

notebook pictured in Figure 1, above] is one of her favorites. At least for showing stereoisomers.

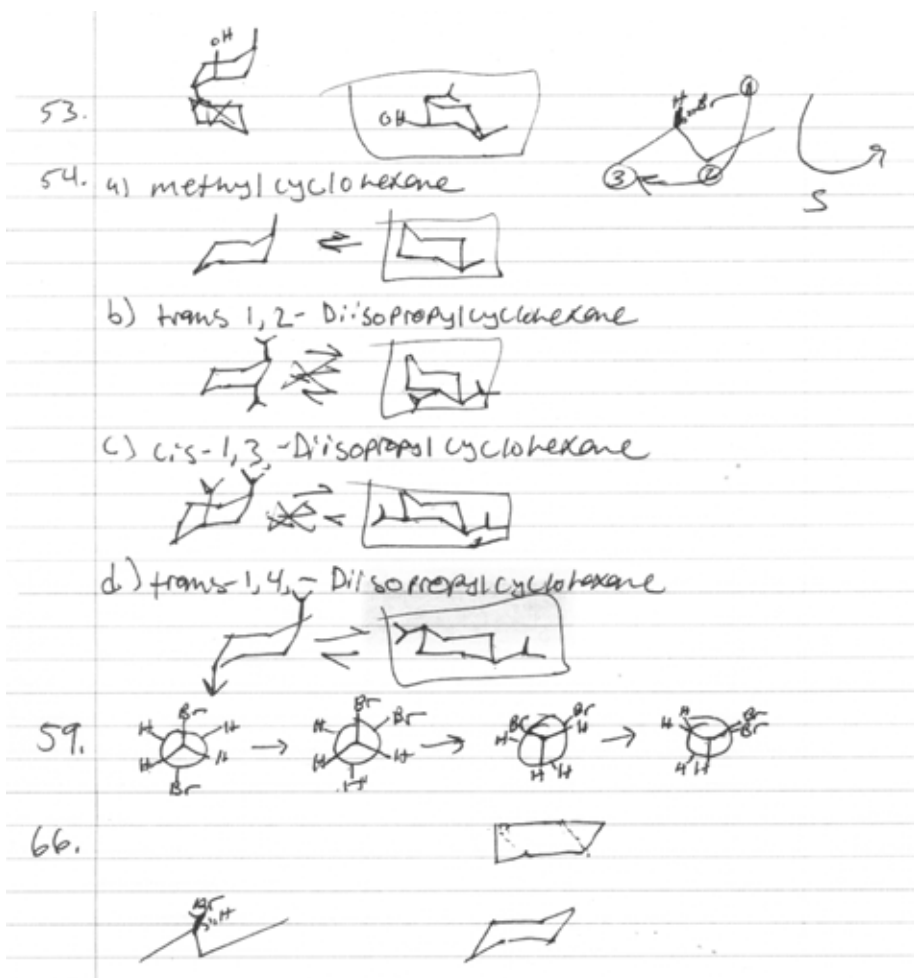


Fig. 2 A page from Samuel's notes for his organic chemistry class. The series of diagrams listed for items 53 and 54 are a series of chair conformation diagrams. The series of diagrams next to item 59 are Newman projection diagrams. The skeletal structure diagram for 2-bromobutane, one of Samuel's professor's "favorite" structures to draw, appears at the top right and bottom left-hand side of the page.

Samuel indicated that he was somewhat surprised at the emphasis placed on students being able to draw the diagrams themselves. I include below a brief excerpt from one of

our interviews during which Samuel describes his organic chemistry professor's emphasis on knowing how to draw chair conformation diagrams:

Samuel: I don't write very neatly and I don't draw very well. So the fact that I had to draw these chair conformations [the diagrams in Figure 2 with the boxes drawn around them] in pen is just weird. Plus, like, one example of drawing them, like learning how to do it ... She taught us to set up each of these. [Samuel picks up a pen and draws the top of the two chair conformation diagrams at the very bottom right-hand side of the page shown in Figure 2] draw 2 parallel lines, set them each apart, and then draw an equilateral triangle. Well, whenever I would do it like that, my chair confirmations would come out looking like this [laughing, and pointing to the top conformation diagram he drew at the bottom of the page]. And I'm like, I don't understand!

KR: I see. So you're trying to get it to look like this [pointing to one of the chair conformation diagrams in the middle of the page].

Samuel: So I learned, ok if I do this and draw this up and draw this down, just do dramatic everything then it comes out looking like a chair conformation [drawing the chair conformation diagram at the very bottom right-hand side of the page].

KR: And she actually had to teach people in class, like, this is how to do the chair conformation?

Samuel: The book does it one way, she does it another way and I was just like.

KR: How does the book do it?

Samuel: It's weird. It says something about drawing a deep V. Here it is [pointing to a page of his textbook]. Draw this V then a line cutting the V in half, then draw a dramatic line going into the, in the plane, then back up, then, just weird, five different steps. Drawing it all in pieces.

In this portion from the interview, Samuel describes and illustrates no fewer than three different techniques he has encountered for drawing chair conformation diagrams. The first strategy, shown to him by his professor, involves drawing two slightly offset parallel lines and connecting them with two equilateral triangles. His comments regarding the second strategy suggest that it is a version of the first technique but involves drawing sharper, more "dramatic" triangles. The third approach, described and illustrated in his course textbook, involves a five-step process of drawing a series of deep "v" shapes and bisecting them.

As Latour notes, inscriptions are so "mundane," "so practical, so modest, so pervasive, so close to the hands and the eyes that they escape attention" (21). And yet it is through these mixtures of semiotic tools that chemists can represent molecules that cannot be seen with the naked eye and that are messy and confusing to make out even when they are made visible by cutting edge imaging technologies. With a "visual vocabulary" consisting of a few short line segments, simple geometric shapes (a circle, a solid, a set of short dashes), letters in the form of abbreviations for elements and combined

with words and numbers for naming the molecules, these diagrams “present to the eye” a neat and precisely arranged structure. The simple shapes employed in the diagrams Samuel acts with offer up an image of precise order. In fact, given the simplicity of the shapes and symbols being deployed, it would be difficult for these diagrams *not* to present order and precision. The precise ordering is what allows chemists to see features like the positioning of particular atoms and the angles of the various bonds between them. These features, in turn, afford chemists a way of understanding how bonds are likely to change in response to interactions with other molecules, or how easily bonds might be formed or broken.

While these kinds of diagrams certainly allowed Samuel to see the key features and arrangements of molecules, they also presented to his eye a great deal more. According to Prior, the laminated nature of literate activity means that people’s engagements with texts lead to “hybrid actions and understandings” that emerge from the “weav[ing] together [of] personal, interpersonal, artifactual, institutional, and sociocultural as well as disciplinary histories” (*Writing/Disciplinarity* xii). For Samuel, whose history includes a deep and sustained engagement with religious worship, his ability to see, use, and construe scientific diagrams was interwoven with, and thus shaped by, his engagement with his faith. Over multiple interviews, Samuel routinely mentioned how these renderings illuminated God’s handiwork to him. His laminated seeing of chemical inscriptions surfaced quite unexpectedly, for example, during one of our interviews while discussing what he referred to as his “scripture box,” a small box containing a series of three by five-inch index cards on which he had copied some Bible passages he was memorizing and written some of his own comments. I include below an excerpt from that interview, during which we discussed a passage from Colossians:

Samuel: So Colossians 1:17, [reading from an index card with the verse written on it]

“He is before all things and in him all things hold together.” ...There’s nothing apart from him, literally nothing apart from him because everything, institutions, atoms, subatomic particles, everything holds together in Christ.

KR: I can see why you chose that one.

Samuel: And then when people ask me why I believe what I believe or why I think the way I think I say, Hey, well, here’s what the Bible tells me and it actually makes a lot of sense when you study like chemistry, we learn how the trend for the universe is randomness but the very nature of matter, even at the most seemingly insignificant of levels, the microscopic levels, there’s organization. There’s organization that we can actually notice plus there’s still things that we don’t understand about the organization and the structure of an atom, of the nucleus, of orbitals or electrons. We can’t tell with any true 100% certainty where an electron is around an atom in orbit. And that becomes increasingly difficult when we talk about hybridization and the bonding that occurs between an SP³ orbital and an SP³ orbital like in ethane. Carbon carbon sigma bond is in SP³ orbital. We know that the electrons are somewhere in here but the bond angle is greater than the atomic radius of one carbon. So we don’t know for certain, with even less certainty where it is.

After reading the verse, Samuel elaborates the phrase “all things hold together” by emphasizing that “all things” encompasses “institutions, atoms, and subatomic particles.” Following my brief comment about his decision to choose Colossians 1:17, Samuel then indicates that everything being held together by a divine maker is consistent with what the study of chemistry has illuminated regarding the ordered design of even the smallest levels of organization for the physical world. As examples, he evokes the structure of the atom and its constituents and the bonds between the carbon atoms in a molecule of ethane, structures typically represented in the diagrams he would have encountered during lectures for his science courses, on the pages of his course textbooks, and in the materials provided in the course’s online resources, and inscribed on the pages of his notebook. For Samuel the organization and order “at the microscopic levels” made visible by diagrams depicting the sp^3 bonding in ethane, for example, evidence God’s ability to “hold all things together.”

Samuel’s heterogeneously distributed seeing of chemical inscriptions also surfaced unexpectedly during a later interview as we discussed his studying strategies. Explaining how he made sense of the complicated content of his organic chemistry courses, he stated,

With organic, I see nucleophilic attacks, electrophilic attacks, things of that nature, carbohydrate shifts, hydride shifts. Like, I can visualize that in my head and so I see that in terms of anime and video games. And then when I get to see major product versus minor product, what’s more stable, what’s less stable, I’m like, oh, that makes sense because, hey, our God is a God of order, our God is a God of structure and so it makes sense that this membered ring would be favored over, say, a seven-membered ring which is all wobbly and unstable. Six-membered ring, you can have different chair conformations, you can do just a whole bunch of really cool things with it so it makes more sense for the structure to favor it versus that. And also five-membered rings. They’re fine, too. Which is why our DNA is comprised of a five-membered carbon sugar because ribose is six-membered.... You get to see all of the order in it so, like, with me it just makes everything make more sense.

After commenting that he understands various kinds of molecular “attacks” and “shifts” in terms of how characters interact in the anime he reads and video games he plays, Samuel explains that he makes sense of nature’s tendency toward the more stable five and six-membered cyclohexane rings, which he had invested no small amount of time drawing and examining, in light of his understanding of God’s tendency toward structure and order. The stability made visible in the comparing structural diagrams of six-membered rings to those of seven-membered rings evidenced for him the structure and order inherent in God’s design.

To echo Latour, science is not all that Samuel is seeing or doing when he looks exclusively and obsessively at the inscriptions animating his science coursework. Samuel’s engagements with these and other diagrams entangle his experience of disciplinary science with his long history of religious worship. While these linkages might seem like fleeting happenstance co-minglings of two distinctly different homogeneous social activities and worlds, we might instead view them as Samuel’s laminated encounters

with inscriptions in light of the complex heterogeneity of his history with both religion and disciplinary science. On the one hand, Samuel's laminated seeing of these inscriptions is supported by his engagement with the Black church that has figured so prominently in his life. In her chapter in *Literacy in American Lives* titled "'The Power of It': Sponsors of Literacy in African American Lives," (see also "Accumulating Literacy"), Deborah Brandt indicates that the church has functioned as "the most essential cultural institution for the well-being of African Americans since their forced arrival on this continent" (110-111). As a literacy sponsor, the Black church promotes "certain meanings, styles, postures, and inflections that reflect a unique racial history ... a set of interpretations and values that ... can shape reading and writing in many direct, indirect, and long-lasting ways" (145). As Brandt discovered during her research, one particularly salient feature of the Black church's sponsorship of its members' literacy practices is the idea that "religious and secular values and styles can coexist with the same practice or the same interpretive stance" (143), an orientation toward literate practice which affords "a multiplicity and simultaneity to the meanings of literacy—a synergy that often combines practical and spiritual significance and that makes one meaning less compelling without the other" (123). According to Brandt, this connection "works against the rather sharp divisions between secular and religious literacy that widened generally through the twentieth century" (118).

Brandt offers Jordan Grant (whom she refers to as Charles Randolph in "Accumulating Literacy"), the son of an African American preacher, as an example of how this orientation shapes a literate life. Tracing Grant's encounters with writing throughout his lifespan, Brandt notes how his father's style of writing sermons informed the prose in Grant's high school essays, the papers he crafted as an undergraduate English major, the reports he wrote for his administrative job, the pages of his doctoral dissertation, and the presentations he created for his current job as a consultant. It seems reasonable to surmise that the same relationship between spiritual and secular inspired by the church that animates Grant's encounters with literacy is also at play in Samuel's, even though their respective inscriptions emphasize different semiotic modes. Samuel did not mention that the Black churches he attended throughout his life offered sermons or lectures about the interweaving of faith and science. He did indicate, though, that the church he attended during his time at college had a mentoring program for new members, and the mentor he was assigned and met frequently with was a Black "scientist of faith." These heterogeneities texturing his engagements with religious worship would seem to afford Samuel's laminated seeing of scientific diagrams.

In addition, Samuel's identifications of God's handiwork in these kinds of inscriptions are also supported by his encounters with a number of science teachers and professors throughout his experiences in high school and college. Some of those encounters quite explicitly linked science and religion. While talking about some of the "people of faith" he had met in his science classes, for example, Samuel mentioned that he and one of his high school chemistry teachers, "would talk about God and we would talk about science all of the time. Just all of the time." Describing one particular instance in that class, Samuel mentioned that the teacher was showing "a picture of a neuron" to examine the neuron's

myelin sheath and the fact that the charge impulse is stimulated by the uptake and release of sodium and calcium into the cell, and it releases neurotransmitters. It does this at a constant rate, a rate which we could never quite process. And all of those things turn into thoughts and or functions.

Commenting on the precisely ordered elegance depicted in the picture, his teacher asked the class, "How could people look at this and not say that that's the tapestry of God?" Other encounters Samuel mentioned were less explicit, such as when one of his undergraduate chemistry professors mentioned during a lecture that the Higgs Boson particle was commonly referred to as "the God particle," or when his undergraduate physics professor gifted Samuel a French translation of the Bible when Samuel mentioned to him that he had enrolled in a summer study-abroad program in Paris. Many of the other encounters Samuel brought up simply highlighted his teachers' openness to discuss religious issues. While talking about his undergraduate biology lab, for example, Samuel stated that he and the post doc leading the lab section "talk about pretty much everything. Any question I would have I would go to him about it. At one point we had a discussion on attributes of God and intelligent design and how evolution may or may not play a part in it." These interanimations of science and faith would also seem to support Samuel's laminated seeing of the diagrams he encountered in his coursework.

From a literate activity perspective, in weaving together his interest in science and his history of religious worship as he acts with inscriptions, Samuel is taking advantage of the co-genetic linkages, the affordances for alignment, that are already woven into his experiences with the church and in his science coursework. Rather than emerging solely from his encounters with disciplinary science, Samuel's seeing of the ethane, cyclohexane, and nerve cells is heterogeneously situated across and complexly mediated by his engagements with both science and the orientation to African American spirituality sponsored by the Black church. One important consequence of this lamination for Samuel is that it creates opportunities for him to draw his faith together with his science and his science together with his faith. Acting with inscriptions, in other words, occasions for Samuel what Gesa Kirch describes as "rich dimensions of reflection, introspection, and contemplation which lead us to know and understand things beyond the analytical mind" needed to "nourish and sustain an inner life" (58).

Toward Potential Futures

Just as Samuel's encounters with inscriptions in his near and distant past functioned as resources for present moments of action during his initial undergraduate science courses, the heterogeneity that textured those encounters also propelled action toward Samuel's potential futures. I turn now to elaborating how Samuel's laminated seeings of scientific inscriptions continued to inform his literate activity and his semiotic becoming throughout his final year at college and his graduate veterinary program.

One prominent way that Samuel's acting with inscriptions shaped his literate activity as an undergraduate is visible in the thesis he researched and wrote throughout his senior year, a project for which he examined the relationship between science and religion. Framed as a kind of overview of his development as a scientist of faith over his

four years of college, Samuel's thesis offers readers some glimpses into his own experiences navigating this relationship. In contrast to the dominant cultural narrative that he described in his theses as viewing science and faith as "mutually exclusive or at the very least thought to operate in vastly different spheres such that one ought not to influence the other," Samuel wrote that by his senior year of college he had come to view them as existing in a productive resonance. Articulating his central argument in his abstract, Samuel writes, "the relationship between science and faith seems to be a synergistic one: the two enhance one another. As individuals study both the book of nature and the book of scripture, their love of God and enthusiasm for science are both enhanced."

In the opening portion of his thesis, Samuel indicates that he arrived at his conclusion by observing that science and faith had enriched one another in a number of ways in his life as an undergraduate: "As I began to grow in my knowledge of God and the Scriptures, I was also growing in my knowledge of biology and chemistry.... As I studied science more deeply, He seemed more fascinating, more brilliant, and more beautiful than I'd first realized. This, in turn, made me want to study science even more so that I could see more of the awesomeness of God." Over the next thirty-nine pages, Samuel points to a number of particular instances in which science and faith had come to be entangled in his life, reaching back to his initial years as an undergraduate. Each of the instances Samuel describes involved his close encounters with inscriptions.

In one passage, reflecting on the introductory science courses he took during his initial year as a microbiology major, Samuel writes,

By viewing science in light of the sovereignty of God, I grew increasingly fond of Him and His creative genius. In each of my biology and chemistry courses, the incredible complexity and intricacy of the various systems that allow living beings, animals and microbes alike, to function left me in an incredible state of awe. Far too often I would find it rather difficult to contain my elation as my professors outlined these systems in great detail. Many times these observations simply made sense in light of the Character of God as expressed through the Scriptures.

In this passage, Samuel indicates that it was the "incredible complexity and intricacy of the various systems that allow living beings, animals and microbes alike, to function" presented to his eye through the many inscriptions in his biology and chemistry classes that provided him with a view of "the character of God." For Samuel, viewing "science in light of the sovereignty of God" not only helped him make sense of the complex systems represented in the diagrams, but also enhanced his appreciation for "His creative genius."

In a passage from his concluding chapter, in which he reflects on the full arc of his trajectory across the undergraduate curriculum, Samuel writes,

As I have studied science, from biology to biochemistry, I have become more fascinated by the God I had come to know through the scriptures. Studying His character and seeing some of His characteristics reflected through the ways in which the elegant molecular systems that allow all of life to function at times overwhelms me with elation. Many times I can barely contain my joy and awestruck wonder as more and more of the power, genius, and creativity of

God become apparent through the study of the book of nature. It drives me to love and follow Him more fervently with my heart, mind, and soul, while simultaneously making me more eager to study the science through which these attributes emanate.

Here, Samuel indicates that it was through examining “the elegant molecular systems that allow life to function” made readily visible through the inscriptions he encountered in courses “from biology to biochemistry” that he became “fascinated by the God I had come to know through the scriptures.” For Samuel, the “elegant systems” made visible by the inscriptions reflected “the power, genius, and creativity of God.” This increased insight into the character of the Creator also motivated Samuel to engage more deeply with “the science through which these attributes emanate.”

Latour suggests that the ordinary, practical, and ubiquitous nature of inscriptions can make them easy to overlook, but that was certainly not the case with Samuel. Those seemingly mundane encounters with inscriptions held some enduring consequences for Samuel’s becoming as a scientist-in-the-making. For Samuel, multiple entanglements with these inscriptions across multiple courses brought science and religion together for him. Based on what he describes throughout his thesis, the interweaving of science and religion was not just something he did initially in his early science courses and that eventually subsided as he progressed through the curriculum, something that faded as his participation with science deepened. Rather, it increasingly intensified. Over four years, Samuel’s laminated seeing of diagrams deepened and enriched not just his knowledge of science, but also his “affective intensities” (Leander and Boldt) that motivated him to know more about science. In turn, his enriched view of science also deepened his affective intensities supporting his desire for knowing more about God’s character.

Those laminated encounters with inscriptions also occasioned a crucial discursive space across which he could inscribe faith into his science and his science into his faith. In the pages of his thesis, Samuel’s engagement with inscriptions, now indexed by and entextualized in his prose descriptions, enabled him to write himself into the long tradition of people like Galileo and Jonathan Edwards who developed a synergistic relationship between faith and science. Over four years, Samuel, who initially “had trouble trying to see science and God in the same vein” and who opted to background his faith to pursue a career in science, shifted his orientation to become a scientist of faith. The importance of both science and faith in shaping Samuel’s becoming cannot be overstated. The biographical statement he crafted for the front matter of his thesis is especially telling in this regard. Offering a third-person overview of his accomplishments throughout his undergraduate years, he writes,

He was involved in ministry on campus leading Bible studies for his residence hall, ministry and evangelism small groups, and various prayer meetings. His major area of study was Microbiology, and he studied French Language as his minor. After graduation, he will study veterinary medicine at [name of university] in the fall of 2014.

It is significant that Samuel leads by announcing his religious engagements *before* indicating his academic major and minor and *before* noting that he would attend veterinary school.

This trajectory of interanimating science and faith continued as Samuel navigated four years of veterinary school. During that time, Samuel led a large weekly Bible study for members of his cohort, and also co-facilitated a smaller Bible study as his schedule allowed. In addition, he was also deeply involved with some of the Christian veterinary organizations on his campus. Samuel graduated from veterinary school in Spring 2018, and soon afterwards started work as a veterinarian in a large city near his hometown. He also joined and became an active member of one of the nearby churches, and, as his busy schedule permits, he has continued his participation with the religiously affiliated veterinary medicine organizations at his alma mater.

In *Identity and Agency in Cultural Worlds*, Dorothy Holland, William Lachicotte, Debra Skinner, and Carole Cain state that “identities ...do not come into being, take hold in lives, or remain vibrant without considerable work in and for the person” (vi). As these and other scholars (McBeth; Prior, “How Do”; Zittoun; Zittoun, et al.; Wang, “Becoming”) have argued, much of the work of becoming involves acting with inscriptions, as inscriptions create the discursive and material spaces where people can do that work. Describing the variety of inscriptions central to his becoming as a Queer kid in rural Central Pennsylvania, the array of texts “that promised something that lied beyond my boundaries, but maybe still attainable someday” (7), McBeth writes that “early in my preadolescent life, I read (and then rewrote) the world because I felt dissatisfied with the one in which I lived; drawing, reading, writing, and viewing spurred that fantasy world which buoyed me until I could make life-changing decisions as an adult” (7). To overlook Samuel’s acting with inscriptions would be to overlook the very text that allowed him to, quite literally, draw together important histories of meaning-making in ways that allowed him to assemble an identity as a veterinarian who can be a leader in his church. In this sense, Samuel’s laminated trajectory as a scientist-in-the-making underscores the vitally important roles that inscriptional texts, practices, and spaces play in the complex, historical, embodied, and necessarily semiotic work of human meaning-making and becoming. The heterogeneous experiences that inscriptions pull together along Samuel’s history highlight what Kevin Roozen and Joe Erickson in *Expanding Literate Landscapes* concluded based on their analysis of people’s efforts to construct identities from their laminated histories with both disciplinary and vernacular literate activities: “We don’t become who we are, write how we write, represent how we represent, by cutting ourselves off from all other domains of our lives and living evermore purely in some disciplinary center. We become who we are and engage in disciplinary activity by tying together and connecting all the resources we have developed in ever surer and richer ways” (Chapter 1).

Like the people in Roozen and Erickson’s book, who Samuel comes to be and what he comes to know and see, and the practices that shape his knowing and seeing, all emerge from weaving together interanimating histories of acting with semiotic tools that reach across his expansive, and ever expanding, literate landscape and the many moments of his life.

Expanding our Perspectives of Writing, Learning, and Becoming

In “Transitions as Dynamic Processes” Tania Zittoun points out that throughout the lifespan, human development emerges from “the constant process people have of connecting on-going experiences with past ones and possible and future ones, thanks to internalized or surrounding semiotic means— more or less organized or complex traces of past experiences, words, languages, images and so on” (233). Understanding how to best support people’s knowing and becoming, then, involves paying close, careful attention to all of the many semiotic traces, in whatever medium, people transform, coordinate, use, and recruit into fashioning their connections and the pathways those connections create. Focusing attention on only some of those traces would certainly illuminate the work those traces do and the connections they afford, but would leave blurry other traces and their work and connecting. The result would leave us with only a very partial understanding of people’s ways of knowing and being and a very confusing patchwork of their pathways of knowing and becoming. In its focus on “acts of meaning making that are mediated through texts” (Witte 237), writing research has tended to overlook those texts which do not fit so comfortably within dominant notions of writing, texts which, to draw upon Medway, “do not fall neatly within a narrow definition of ‘writing research’ because they make use of other semiotic media as well, sometimes to the near exclusion of writing” (128). This analysis of Samuel’s engagements with scientific diagrams illuminates the prominent role that such texts—the kinds of complex semiotic traces I refer to in this article as inscriptions—play in Samuel’s linking together of his experiences with religious worship to those with disciplinary science in ways that have long-term consequences for his becoming as a scientist of faith.

Accounting more fully for people’s engagements with inscriptions, and their roles and functions in people’s lives, means finding ways of analytically untangling the wide range of texts and textualities that get collapsed into and hidden within our typical representations of “reading a book” or “writing a paper” or “taking notes” and the official texts and practices privileged by those representations. And, once those texts have come into view, it means paying attention to those texts that we see, regardless of the semiotic modes they emphasize, the sensory modalities of their use, and regardless of how comfortably they might fit, or not, with our typical ideas about writing. Informed by the theoretical foundations they work from, researchers taking up literate activity perspectives have used a number of approaches for unraveling textual action in the world. In addition to conducting practice- and process-based interviews over many years, as I did with Samuel, literate activity perspectives have benefited from having co-researchers keep logs of their activities related to particular textual engagements (Durst; Prior, *Writing/Disciplinarity*), inviting co-researchers to graphically represent their writing processes and spaces for writing (Prior and Shipka; Shipka), conducting initial literacy history interviews with co-researchers as a way of getting a sense of the breadth of their experiences with literacy (Roozen, “Fan fic-ing”); conducting interviews over extended periods (Fraiberg, “Pretty Bullets”), and making videorecordings of people engaged in activity (Prior, “Remaking IO”; Shivers-McNair), all of which have offered glimpses into the dense tangle of varied texts, but also other actors of the sort identified by Prior and Shipka, that get collapsed into typical representations of literacy. These kinds of meth-

odological moves make it easier to account for the kinds of texts and types of textualities that might otherwise remain hidden in plain sight by commonplace notions about what writing looks like and what it entails.

This portrait of Samuel's engagement with disciplinary science offered here provides a glimpse of the many kinds of inscriptions tangled into those textual activities. His experiences with science certainly included many texts and activities privileged by writing studies' dominant view of that activity, including textbooks, classroom lectures, lab reports, and an undergraduate thesis. Woven into those experiences were inscriptions like those in his chemistry notebook and the many diagrams he mentioned, but also copies of the Bible (including the French translation offered to Samuel by his physics professor) and the scripture box filled with index cards containing copied Bible verses Samuel was working to memorize. Careful readers will also notice in one of the interview excerpts offered earlier Samuel's references to anime and video games in terms of how he understands molecular attacks and shifts. Other inscriptions that emerged in the data as being woven into Samuel's engagement with science (but that are not mentioned in the data excerpts offered in this article) include books of manga; a t-shirt featuring *Fullmetal Alchemist*, Samuel's favorite anime series; a copy of his Bible with marginal notes, highlighting, and underlining; notes Samuel took on the pages of the notebook he used during sermons and Bible studies; and outlines and diagrams Samuel produced and used for the Bible study meetings he led.

Beyond cataloging and examining the incredible variety of texts tangled into people's textual engagements, attending more fully to inscriptions also demands developing a sense of how people act with them in the world. Doing so entails moving beyond just examining the inscriptions themselves to examining them as "artifacts-in-activity" (Prior, "Writing, Literate" 187), as tools in use. Finding ways of getting at the actualities of how and why people act with a particular inscription can reveal a great deal. After all, inscriptions do not instantly appear fully formed in some site of engagement, and they are not inert objects. As cultural tools fashioned by human hands, inscriptions are continually coming to be throughout their histories of concrete use in and across multiple repurposings, many for which they may not have been intended and might differ from conventional or past usage by others. People's uses of inscriptions involve coupling them with other semiotic resources such as talk, gesture, movement, objects, and other inscriptions, and with other affective valences, motivations, interests, and values, and coordinating those complex intra-actions in emergent moments and across lengthy histories of performance. Getting people to talk about their actual uses of a particular inscription can illuminate much about their histories with it, the conditions under which they encountered it, how they have refashioned or "repurposed" (Prior and Shipka 215) it and to what end. Like the kinds of texts that emerge from the tangles of people's literate activities, the textual experiences people convey might trouble dominant perspectives or our own expectations and might take us beyond the borders and boundaries we assume, but it is important to look for, acknowledge, and examine those experiences, and to write them into our accounts of writing and learning.

The account of Samuel's engagement with diagrams offered here provides some insight into what can be gained by attending to people's concrete encounters with inscriptions. It was by talking with Samuel across multiple interviews about his expe-

riences of the lectures in his science courses and looking at pages of his notebooks for those classes, and then at some of the particular diagrams that littered those pages (and having Samuel guide me through his own extensive and richly-detailed “interpretive journeys” as he explained those diagrams to me) that I finally came to understand the central importance of the diagrams and the emphasis placed on knowing how to draw them and see with them. And it was during conversations with Samuel about his use of the diagrams he encountered and drew for his science course, and the inscriptions he used for his religious worship, especially the verses on the index cards in his scripture box, that Samuel would articulate how a stick-figure representation of a cyclohexane molecule revealed to him features of God’s character, and how a verse from Colossians represented to him the ordered structure of the carbon bonds in a molecule of ethane. Having taken organic chemistry as an undergraduate, although some thirty-plus years ago, I had many encounters with seeing and talking about and drawing the kinds of diagrams inscribed on the pages of Samuel’s notebook. And having spent a considerable portion of my adolescence with religious worship, particularly in my family life and my schooling, I had many encounters with Bible verses, and even with the book of Colossians in particular. But even with my histories with those inscriptions, without those conversations with Samuel I would never have seen the connections between those inscriptions that were so apparent to him.

Attending closely and carefully to people’s inscriptions and inscriptional practices stands to enrich and extend what we know about people’s writing, learning, and becoming. For textual activities where our inquiry has been dominated by what Prior refers to as a “just writing” perspective, attention to inscriptions can illuminate the wealth of other kinds of texts and textualities at play. Situated studies of the literacy activities animating religious practice, for example, have offered fine-grained examinations of people’s engagements with canonical texts and discourse and with written texts such as sermons (Moss, “Creating”; *A Community*). Attending to inscriptions could illuminate the wealth of other semiotic texts and practices shaping people’s experiences with their faith. Many textual activities have gone largely unexplored, not because of a dearth of texts, but rather because those texts, like the architecture sketchbooks that Medway examines, “do not fall neatly within a narrow definition of ‘writing research’ because they make use of other semiotic media as well, sometimes to the near exclusion of writing” (128). Attention to inscriptions could extend our inquiry into disciplinary worlds which are rich with such texts, such as the performing arts, but have not received a great deal of attention in WAC/WID scholarship. Across all disciplines, increased attention to inscriptions offers one way for faculty to move toward “understanding much deeper and more challenging ideas about the interrelationships between students’ existing knowledge or experiences and the nature, constraints, and activity systems of the writing they are asked to do” (Anson 542-543). Many kinds of workplace literate activity have likewise gone unexplored by writing research, because rather than extended prose engagement, such discourses feature the kinds of texts Mike Rose describes as exhibiting “complex symbolic fields,” combining numbers, graphics, and writing “of a limited sort,” animated by talk and interaction (126).

Perhaps most importantly, increased attention to inscriptions could significantly enrich and extend what we know about how people weave all of these experiences

together. In helping us to gain fuller perspectives of the wealth and variety of texts and textualities that inform people's lives, increased attention to inscriptions can reveal the trajectories of meaning-making that people assemble across disciplinary, professional, community, and personal engagements, and the discursive spaces that can allow people to weave those engagements together. Without fuller attention to inscriptions, and the paths of meaning-making people build across their lifeworlds and throughout their lifespans, our accounts of how people come to know and be in the world, and of the practices people use in composing themselves and the social worlds they navigate, remain incomplete and confusing. But those humanizing accounts of literate activity, I argue, provide the foundation for designing pedagogical changes and opportunities to account for and responsively support our historical, social, and epistemological ways of becoming.

Works Cited

- Anson, Chris. "The Pop Warner Chronicles: A Case Study in Contextual Adaptation and the Transfer of Writing Abilities." *College Composition and Communication*, vol. 67, no. 4, 2016, pp. 518-549.
- Bakhtin, Mikhail. *Speech Genres and Other Late Essays*. Translated by Vern W. McGee, edited by Caryl Emerson and Michael Holquist, University of Texas Press, 1986.
- Barad, Karen. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Duke University Press, 2007.
- Bazerman, Charles, and Paul Prior. "Introduction." *What Writing Does and How It Does It: An Introduction to Analyzing Texts and Textual Practices*, edited by Charles Bazerman and Paul Prior, Lawrence Erlbaum, 2004, pp. 1-10.
- Bellwoar, Hannah. "Everyday Matters: Reception and Use as Productive Design of Health-Related Texts." *Technical Communication Quarterly*, vol. 21, no. 4, 2012, pp. 325-345.
- Brandt, Deborah. "Accumulating Literacy." *College English*, vol. 57, no. 6, 1995, pp. 649-668.
- Brandt, Deborah. *Literacy in American Lives*. Cambridge University Press, 2001.
- Buck, Amber. "Examining Digital Literacy Practices on Social Network Sites." *Research in the Teaching of English*, vol. 47, no. 1, 2012, pp. 9-38.
- Chiseri-Strater, Elizabeth. *Academic Literacies: The Public and Private Discourse of University Students*. Heinemann, 1991.
- Cintron, Ralph. *Angels Town: Chero Ways, Gang Life, and the Rhetorics of Everyday*. Beacon, 1998.
- Dixon, John. *Growth through English*. Oxford University Press, 1967.
- Durst, Sarah. "Disciplinary and Literate Activity in Civil and Environmental Engineering: A Lifeworld Perspective." *Written Communication*, vol. 36, no. 4, 2019, pp. 471-502.
- Fraiberg, Steven. "Composition 2.0: Towards a Multilingual and Multimodal Framework." *College Composition and Communication*, vol. 62, no. 1, 2010, pp. 100-126.
- . "Pretty Bullets: Tracing Transmedia/Translingual Literacies of an Israeli Soldier across Regimes of Practice." *College Composition and Communication*, vol. 69, no. 1, 2017, pp. 87-117.

- Goffman, Erving. *Forms of Talk*. University of Pennsylvania Press, 1981.
- . *Frame Analysis: An Essay on the Organization of Experience*. Harvard University Press, 1974.
- Holland, Dorothy, William Lachicotte, Debra Skinner, and Carole Cain. *Identity and Agency in Cultural Worlds*. Harvard University Press, 1998.
- Hutchins, Edwin. *Cognition in the Wild*. MIT Press, 1995.
- Ivanic, Roz. *Writing and Identity: The Discoursal Construction of Identity in Academic Writing*. John Benjamins, 1998.
- Johri, Aditya, Wolff-Michael Roth, and Barbara Olds. "The Role of Representations in Engineering Practices: Taking a Turn Toward Inscriptions." *Journal of Engineering Education*, vol. 102, 2013, pp. 2-19.
- Kell, Catherine. "Literacy Practices, Text/s, and Meaning Making across Time and Space." *The Future of Literacy Studies*, edited by Michael Baynham and Mastin Prinsloo, Palgrave Macmillan, 2009, pp. 75-99.
- Kell, Catherine. "Making People Happen": Materiality and Movement in Meaning-Making Trajectories. *Social Semiotics*, vol. 45, no. 2, 2015, pp. 423-445.
- Kirsch, Gesa E. "Creating Spaces for Listening, Learning, and Sustaining the Inner Lives of Students." *Journal of the Assembly for Expanded Perspectives on Learning*, vol. 14, 2008-2009, pp. 56-67.
- Latour, Bruno. "Drawing Things Together." *Representation in Scientific Practice*, edited by Michael Lynch and Steve Woolgar, MIT Press, 1990, pp. 19-68.
- Latour, Bruno, and Steve Woolgar. *Laboratory Life: The Scientific Construction of Scientific Facts*. Sage, 1979.
- Leander, Kevin, and Gail Boldt. "Rereading 'A Pedagogy of Multiliteracies': Bodies, Texts, and Emergence." *Journal of Literacy Research*, vol. 45, 2013, pp. 22-46.
- Lillis, Theresa. "Ethnography as Method, Methodology, and "Deep-Theorizing": Closing the Gap between Text and Context in Academic Writing Research. *Written Communication*, vol. 25, no. 3, 2008, pp. 353-388.
- Marotta, Calley. "Who Has the Right to Write? Custodian Writing and White Property in the University." *College English*, vol. 81, no. 3, 2019, pp. 163-82.
- McBeth, Mark. *Queer Literacies: Discourses and Discontents*. Lexington Books, 2019.
- Medway, Peter. "Fuzzy Genres and Community Identities: The Case of Architecture Students' Sketchbooks." *The Rhetoric and Ideology of Genre: Strategies for Stability and Change*, edited by Richard Coe, Loreli Lingard, and Tatiana Teslenko, Hampton Press, 2002, pp. 123-153.
- Miller, Peggy, Hengst, Julie, and Wang, Su-hua. "Ethnographic Methods: Applications from Developmental Cultural Psychology." *Qualitative Research in Psychology: Expanding Perspectives in Methodology and Design*, edited by Paul M. Camic, Jean E. Rhodes, and Lucy Yardley, American Psychological Association, 2003. pp. 219-242.
- Moss, Beverly. *A Community Text Arises: A Literate Text and a Literacy Tradition in African-American Churches*. Hampton, 2003.
- . "Creating a Community: Literacy Events in African American Churches." *Literacy Across Communities*, edited by Beverly J. Moss, Hampton, 1994, pp. 147-178.
- Musgrove, Laurence, and Myra Musgrove. "Drawing is Learning." *Journal of the Assembly for Expanded Perspectives on Learning*, vol. 20, 2014-2015, pp. 91-102.

- Ochs, Elinor, Sally Jacoby, and Patrick Gonzales. "Interpretive Journeys: How Physicists Talk and Travel through Graphic Space." *Configurations*, vol. 2, no. 1, 1994, pp. 151-171.
- Pratt, Mary Louise. "Arts of the Contact Zone." *Profession*, vol. 91, 1991, pp. 33-40.
- Prior, Paul. "How do Moments Add up to Lives: Trajectories of Semiotic Becoming vs. Tales of School Learning in Four Modes." *Making Future Matters*, edited by Rick Wysocki and Mary P. Sheridan, Computers and Composition Digital Press/Utah State University Press, 2018. Retrieved from <http://ccdigitalpress.org/makingfuturematters>.
- . "Remaking IO: Semiotic Remediation in the Design Process." *Exploring Semiotic Remediation as Discourse Practice*, edited by Paul Prior and Julie Hengst, Palgrave/Macmillan, 2010, pp. 206-234.
- . "Setting a Research Agenda for Lifespan Writing Development: The Long View from Where?" *Research in the Teaching of English*, vol. 52, no. 2, 2017, pp. 211-219.
- . "A Sociocultural Theory of Writing." *The Handbook of Writing Research*, edited by Charles MacArthur, Steve Graham, and Jill Fitzgerald, Guilford Press, 2005, pp. 54-66.
- . *Writing/disciplinarity: A Sociohistoric Account of Literate Activity in the Academy*. Erlbaum, 1998.
- . "Writing, Literate Activity, Semiotic Remediation: A Sociocultural Approach." *Writing(s) at the Crossroads: The Process/Product Interface*, edited by Georgeta Cislaru, John Benjamins, 2015. pp. 183-202.
- Prior, Paul, and Jody Shipka. "Chronotopic Lamination: Tracing the Contours of Literate Activity." *Writing Selves, Writing Societies: Research from Activity Perspectives*, edited by Charles Bazerman and David R. Russell, The WAC Clearinghouse, 2003, pp. 180-238.
- Roozen, Kevin. "Coming to Act with Tables: Tracing the Laminated Trajectories of an Engineer-in-the-Making." *Learning, Culture, and Social Interaction*. Special Issue. *Writing Across: Tracing Transliterations as Becoming over Time, Space, and Settings*, vol. 24, 2020, pp. 1-12.
- . "'Fan fic-ing' English Studies: A Case Study Exploring the Interplay of Vernacular Literacies and Disciplinary Engagement." *Research in the Teaching of English*, vol. 44, no. 2, 2009, pp. 136-169.
- Roozen, Kevin, and Joe Erickson. *Expanding Literate Landscapes: Persons, Practices, and Sociohistoric Perspectives of Disciplinary Development*. Logan, UT. Computers and Composition Digital Press/Utah State University Press, 2017.
- Rose, Mike. "Words in Action: Rethinking Workplace Literacy." *Research in the Teaching of English*, vol. 38, no. 1, 2003, pp. 125-128.
- Shipka, Jody. *Toward a Composition Made Whole*. University of Pittsburgh Press, 2011.
- Shivers-McNair, Ann. "Mediation and Mattering: A Case Study of Making Literacies in a Maker Space." *Language, Culture and Social Interaction*, vol. 24, 2020, pp. 12-34.
- Stornaiuolo, Amy, Anna Smith, and Nathan Phillips. "Developing a Transliterations Framework for a Connected World." *Journal of Literacy Research*, vol. 49, 2017, pp. 68-91.
- Voloshinov, Valentin. *Marxism and the Philosophy of Language*, translated by Ladislav Matejka and Irwin Titunik, Harvard University Press, 1973.

- Vygotsky, Lev. *Problems of General Psychology: The Collected Works of L. S. Vygotsky, Volume* ., translated by Norris Minick, Plenum, 1987.
- Wang, Xiqiao. "Becoming Multilingual Writers through Translation." *Research in the Teaching of English*, vol. 54, no. 3, 2020, pp. 206-230.
- . "Tracing Connections and Disconnects: Reading, Writing, and Digital Literacies across Contexts." *College Composition and Communication*, vol. 70., no. 4, 2018, pp. 560-589.
- Wertsch, James V. *Mind as Action*. Oxford University Press, 1998.
- . *Voices of the Mind: A Sociocultural Approach to Mediated Action*. Harvard University Press, 1991.
- Witte, Stephen P. "Context, Text, Intertext: Toward a Constructivist Semiotic of Writing." *Written Communication*, vol. 9, no. 2, 1992, pp. 237-308.
- Zittoun, Tania. "Transitions as Dynamic Processes – A Commentary." *Learning, Culture and Social Interaction*, vol. 3, 2014, pp. 232-236.
- Zittoun, Tania, Jean Valsiner, Dankert Vedeler, Joao Salgado, Miguel M. Goncalves, and Dieter Ferring. *Human Development in the Lifecourse: Melodies of Living*. Cambridge, 2013.