

Reuse in STEM research writing

Rhetorical and practical considerations and challenges

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Text recycling (hereafter TR), sometimes problematically called “self-plagiarism,” involves the verbatim reuse of text from one’s own existing documents in a newly created text – such as the duplication of a paragraph or section from a published article in a new article. Although plagiarism is widely eschewed across academia and the publishing industry, the ethics of TR are not agreed upon and are currently being vigorously debated. As part of a federally funded (US) National Science Foundation grant, we have been studying TR patterns using several methodologies, including interviews with editors about TR values and practices (Pemberton, Hall, Moskovitz, & Anson, 2019) and digitally mediated text-analytic processes to determine the extent of TR in academic publications in the biological sciences, engineering, mathematical and physical sciences, and social, behavioral, and economic sciences (Anson, Moskovitz, & Anson, 2019). In this article, we first describe and illustrate TR in the context of academic writing. We then explain and document several themes that emerged from interviews with publishers of peer-reviewed academic journals. These themes demonstrate the vexed and unsettled nature of TR as a discursive phenomenon in academic writing and publishing. In doing so, we focus on the complex relationships between personal (role-based) and social (norm-based) aspects of scientific publication, complicating conventional models of the writing process that have inadequately accounted for authorial decisions about accuracy, efficiency, self-representation, adherence to existing or imagined rules and norms, perceptions of ownership and copyright, and fears of impropriety.

Keywords: text recycling, self-plagiarism, citation, source use, quotation, STEM writing

I often find that I need to say the same thing (e.g., background about externalities [...]) in multiple papers. I will typically copy and paste text from one paper to the next, highlight it, and then, before the paper goes out I go through and ‘massage’ the text – change around the order of things, change the wording, maybe emphasize something a little more or less. Would that count as self-plagiarism? I’ve often wondered if I was wasting my time by doing that extra manipulation, but it felt odd to just put the same text in multiple documents. At the same time, we do often have to say the same thing and starting from scratch every time feels like a waste too.

– Professor of Economics

1. Introduction

Consider the following example of academic text:

Eye-tracking systems have been used extensively to study the complex processes involved in purposeful reading. By capturing tiny, imperceptible movements of the eye, the devices can reveal the relationship between what readers are doing physically and what processes they are undergoing cognitively. **One important discovery concerns the relationship between the eyes’ movements (called saccades, the intermittent flick of the eyes between two points on a page or screen) and where they come to rest (called fixations, periods between saccades when the eyes are still and focused on a specific place). Between fixations, the information received during saccades is mostly a blur; what comes into the eyes (and brain) during this time is seriously reduced in a process of saccadic suppression.** This phenomenon, captured through eye tracking, suggests that readers are sampling specific textual information in order to derive meaning while ignoring significant amounts of other textual information that can be inferred syntactically, semantically, morphophonemically, or from previous content.¹

For the sake of illustration, imagine that this material is being composed by Author #1 for a peer-reviewed journal article. The bolded text is material that Author #1 has cut and pasted from a previously published article written by Author #2, who has no relation to Author #1. Clearly, the inclusion of the unattributed text is a blatant case of *plagiarism* – the deliberate replication of someone else’s words without reference, passed off as the author’s own. This practice is widely classified as research misconduct across scholarly and professional research domains.

1. For demonstration purposes, the bolded text comes from one of the authors’ publications: Anson, C. M. & Schwegler, R. A. (2012). Tracking the mind’s eye: A new technology for researching 21st century writing and reading processes. *College Composition and Communication*, 64(1), 151–171. The non-bolded text was newly composed.

Now imagine that Author #1 has published several articles on eye tracking and its use in the study of reading processes. Author #1 is writing a new article for submission to a peer-reviewed journal. In this case, however, the bolded text has been cut and pasted verbatim from one of the journal articles previously published by Author #1. The bolded text, Author #1 reasons, accurately explains a process that there is no point in rewording, especially because this new article focuses on the phenomenon of selective sampling in the reading process, which the previous article did not.

Author #1 is engaging in what we refer to as *text recycling* (hereafter TR) – the reuse of textual material (prose, visuals, or equations) in a new document where (1) the material in the new document is identical to that of the source (or substantively equivalent in both form and content), (2) the material is not presented in the new document as a quotation (via quotation marks or block indentation), and (3) at least one author of the new document is also an author of the prior document.² Sometimes problematically referred to as “self-plagiarism,” TR represents a particular kind of linguistic reuse practiced to varying degrees across a wide array of academic disciplines with a range of opinions about its appropriateness and the extent to which attribution is required.

Under the provisions of a grant from the (US) National Science Foundation, we have been studying the nature of TR as a common but unsettled discourse practice in academic settings (see <textrecycling.org>). The project involves three strands of inquiry – one focusing on TR in the context of copyright and contract law, a second involving surveys and interviews with stakeholders (including editors and authors) about beliefs and attitudes concerning TR, and a third in which large corpora of publications generated from the same grants are mined for cases of TR using a unique algorithm developed for the project. Through these interconnected inquiries, we are documenting and reflecting on the complexities of TR as part of the discursive norms and processes of particular communities of practice. Consequently, we bring no judgment to our analyses, instead following a sociocultural framework that views differences in the nature of written communication as socially determined by members of particular discourse communities (Kostouli, 2009). Our goal is first to understand the range of beliefs and practices concerning TR, and second (and more broadly) to continue building on and refining sociocultural and activity-based theories of writing, which bring together considerations of genre construction, authorial roles, tool use (such as the affordances of new technologies), contextual histories, individual and collective goals, and norms that are both established and in a state of evolution.

2. This is a slightly modified definition from our early versions in Pemberton, Hall, Moskowitz & Anson, 2019, and at textrecycling.org.

In this article, we focus on the metadiscourse surrounding TR and the challenges – both practical and ethical – that researchers in the areas known as “STEM” (science, technology, engineering, and mathematics) face when they choose to recycle material or avoid doing so. Our empirical findings from the text analysis strand of the project suggest that TR is a common practice in STEM fields, particularly in engineering (Anson & Anson, 2019; Anson, Moskovitz, & Anson, 2019). Building on our work to date, we explore here the complexities and uncertainties of TR with a focus on matters of attribution. In mapping out these issues, we draw on interviews with scientific journal editors published in Pemberton, et al. (2019) to provide illustrative examples of our findings. In the context of this special issue, we focus especially on the interplay between personal (role-based) and social (norm-based) dimensions of research-based writing in scientific disciplines.

2. The repetitive nature of STEM writing

Attention to TR has focused on STEM fields because the nature of research and writing in these fields makes TR more likely than in many other fields. Two aspects of the STEM research and writing process may account for this practice. One is the relationship between successive research endeavors: the research agenda of scientists tends to move from one study to another closely related study as the findings of one investigation lead to new questions within the same general area of inquiry. In this stepwise accumulation of knowledge, incrementally new knowledge is presented in the context of previously established material: definitions of variables and measures, methodological procedures, equipment, and even much of the relevant literature. The other is that the contemporary scientific enterprise requires researchers to produce a number of workplace documents relating to the subject of inquiry, as part of the “genre chains” (Swales, 2004) or “genre ecologies” (Erickson, 2000) of particular research communities. These include such documents as IRB (Institutional Review Board) protocols, grant proposals and reports, and conference proposals. Together with public-facing documents including journal articles, conference posters, abstracts, and proceedings, these make up the STEM researcher’s genre set (Bazerman, 1994; Devitt, 1991). By the time the researcher gets to the point of composing a scholarly article, many components of that article have already been written along the way.

As members of a broad community of scholars who determine the nature of their own discourse, scientists routinely face decisions about how to include in their new work material that they have already written in either their prior published work or in other documents in the genre set for scientific research. Whether

they choose to recycle and, if so, how they should attribute recycled material to its source depend on a number of complex and intertwined ethical, legal, and practical factors.

3. To recycle or not to recycle

In Pemberton et al. (2019), we identified a variety of factors that disciplinary editors and authors felt were important to consider when deciding whether to recycle text. In detailed interviews with 21 journal editors, 12 of whom were in STEM fields, we asked how TR was viewed in their disciplines, what they thought about TR as a practice, and what guidelines they used – personally or professionally – to help them decide whether to recycle text in their own writing or allow recycled text in their journals. We received a diverse range of responses to these questions, but many common themes emerged, reflecting a clear set of shared concerns, if not necessarily a set of shared values. The perceptions that follow are drawn from responses provided by STEM editors in particular.

3.1 Professional integrity

First, authors are often apprehensive about how TR will be perceived by members of their disciplinary community. Accusations of self-plagiarism, “salami slicing” (submitting multiple publications when one would suffice), or redundant publication can be professionally damaging to authors, editors, and academic journals alike. For this reason, writers may decide not to recycle text, even if the quantity is small or appears in a Methods section. The increasing use of plagiarism-checking software by many STEM journals, such as iThenticate – software that conflates actual plagiarism with TR – may also persuade writers to avoid TR altogether or employ strategies that disguise their recycling (e.g., using synonyms or massaging syntax) and reduce the chances that it will be flagged as TR.

3.2 Efficiency

Some authors may decide to recycle text from one study to another simply because it allows them to write research reports more efficiently. If a series of related articles has relied on the same procedural methodologies and equipment, authors may decide that rewriting descriptions in every article, merely for the sake of making the text look different, is not only a waste of time but a practice that can lead to misunderstandings. As an editor of an experimental psychology journal put it in one of our interviews,

... When it comes to describing methods or theoretical frameworks, there I most often think that we're better off recycling text if the original sourced text explains something clearly and well, and we know that it actually describes the procedure of the framework in a way that someone else could read it and understand it. I would prefer that the next time someone else reads about that procedure or framework somewhere else, if it's the same framework, it's written the same way so that the same understanding is generated.

3.3 Nature of the recycled material

Scientists' sense of the propriety of TR is also affected by factors related to the recycled material itself. One is the quantity of material recycled. While reusing a few phrases or clauses is not generally considered problematic, cutting and pasting multiple paragraphs from previously published work is almost always perceived to be excessive. Between those two extremes, however, there is little agreement among writers about how much TR is acceptable. Some writers draw the line at a single sentence while others are willing to recycle larger amounts.

Another factor is where the material is placed within a research report. STEM writers tend to have fewer concerns about recycling text in sections of an article that are part of its framing apparatus (e.g., Methods, Literature Reviews, and, sometimes, Introductions) than in sections that are expected to present the new, original contributions (e.g., Results, Analysis, and Discussion). But even in the framing apparatus of research papers, authors are often reluctant to recycle more than a few sentences.

The provenance of the source text – specifically, the extent to which the text is considered “published,” “publicly available,” or “accessible” – can also impact writers' judgments about the advisability of TR. A majority of the STEM writers in our study, for example, felt it was permissible to recycle text from unpublished work in a published article, but individual respondents had very different conceptions of what “unpublished” meant and which genres the term applies to. For some, only journal articles, books, and book chapters count as published work. For others, conference proceedings, presentations, posters, and blog posts are documents that have been publicly shared and must therefore be subject to the same kind of careful scrutiny as books and articles when thinking about TR.

3.4 Copyright

Concerns about violating copyright also affect editors' and authors' decisions about TR, and those concerns are frequently exacerbated by their own lack of knowledge about copyright law and how it might apply to TR. While some writers may feel confident that the principle of “fair use” allows them to borrow and/or

repurpose some portions of their previously published work, others may decide that it is better to play it safe and rewrite entire passages than risk any potential legal consequences.

4. Challenges of composing texts in STEM fields – with and without TR

Even after STEM writers have decided whether to recycle text from previous works on a similar topic, they face considerable challenges when composing. To explore these challenges in more detail, we offer fictitious cases of two biochemists, Dr. Agarwal and Dr. Valdez, who are writing up the results of lab projects in genetics. Both researchers' labs are working on various synthetic biology projects in genetics, and these projects all build on the CRISPR/Cas-9 discovery, which created a genome editing technique that is now widely used. Both labs are developing new methods for cloning and engineering genomes in yeast.

When each lab has new results to share in a research article, there are at least two areas where they can expect to write passages with content and purposes similar to that of writing in their own previously published articles. First, in their introductions they will need to describe the evolution of the CRISPR/Cas-9 research, positioning their own new work within that narrative. This is no small challenge, as the origins of CRISPR/Cas-9 were complex, and its uptake in the research community has been widespread. (See Lander, 2016, for a detailed account of the discovery of CRISPR and a sense of the story scientists have to condense in research article introductions that add to this research area.) Second, they will have to share their methods, some of which will be novel because of the aims of the current study, but some of which will be exactly the same as in their prior work.

Let us now imagine that Dr. Agarwal approves of limited uses of TR between articles written in her lab, but that Dr. Valdez does not allow TR from one journal article into another in her lab.

5. Composing STEM articles with TR

Dr. Agarwal allows two specific kinds of TR in her lab. First, she believes the lab has, over time, composed five sentences that very clearly and accurately convey the early discoveries on CRISPR/Cas-9 and that these sentences need to be included in most Introduction sections. Dr. Agarwal believes it is a misuse of the group's time to keep rewriting a passage that reflects a stable narrative, and she also suspects that any further revisions will reduce the clarity of the writing. The group always rewrites a subsequent paragraph that highlights more recent discov-

eries to reflect the latest research and connect directly to the research contained in each manuscript.

Second, there are phrases, sentences, and sentence groups the lab wants to use repeatedly in its journal articles to describe the same methods. For example, the yeast cultures must always be primed for transformation, and in most of their work, this is done in the same manner, using the same materials. The group has developed a clear way of explaining the priming process in four sentences. Dr. Agarwal believes that changing the wording in these methodological passages creates ambiguity about the research; to her, it is important to use the same words in the same order across their work to show that the same things are being done. When the method used to prime the yeast changes, the language that describes it will also change.

Dr. Agarwal takes research ethics seriously and wants to compose texts in a way that is ethical and transparent to editors and readers. She considers her options.

5.1 Citation

Dr. Agarwal's first likely idea is to cite the passages of recycled texts. Initially, this may seem like a simple solution. However, citation will not clearly mark TR for readers because it has not been designed for that rhetorical purpose. In STEM writing, authors almost always cite their own work either as part of the relevant research literature, summarizing their prior, related work on the topic at hand, or to point readers to previously described methods. Given these norms, the presence of a self-citation solely as a marker of recycled text would be exceedingly odd or misleading. A chemist our group interviewed explained this problem:

In a Method [*sic*] section, often people will cite back to a previous [Methods] section [in another paper]. In an introduction, they might cite papers that are setting up the motivation for why they want to go after this problem. In that case, it might not really make sense to cite their previous work even because that work might not be the most pertinent to describing why this is such a problem. I can imagine in that case why they might not cite their previous work that contains essentially the same paragraph introduction.

Thus, we see that the rhetorical purpose of in-text citation in STEM writing does not fit the goal of marking recycled text of the kinds Dr. Agarwal wishes to recycle.

There are further issues with using in-text citation to mark TR. Foremost is that parenthetical or footnote/endnote citations next to a passage that is not in quotation marks is conventionally used in STEM writing to denote paraphrase, not the copying of text. Even if readers could figure out the citation was marking the borrowing of text, they would still not be able to tell where the recycling begins and

ends, only what its source is. And including the recycling in quotation marks – a choice that, by our definition (Moskovitz, 2019), is a decision not to recycle text – would itself strike STEM readers as highly unconventional; quotation for any purpose is rare in most STEM journal articles, and self-quotation to mark TR is not a recognized practice. A biological anthropologist among our interviewees described the quotation dilemma clearly:

I've actually thought about this one in relation to my own work. Particularly just putting quotations around recycled texts from my previous papers and then citing it. The problem here is, for us it's not a discipline norm to quote big chunks of text. Even a sentence, that would be weird. I think that if I submitted a paper with a large quote, quote myself from another paper and citing myself, one of the reviewers or the editors would be likely to say "hey, isn't there some way that you can reword this?" It's kind of a circular problem. I can either just recycle the text and not put quotations around it or I can put quotations around it and be very transparent that it's coming from another one of my own papers and, in all likelihood, because it's not a discipline norm to do that, have it asked of me that I rephrase, which is kind of a weird trap.

One additional disincentive to citing recycled material concerns self-representation. A large amount of self-citation in journal articles is often viewed cynically as crass self-promotion, since quantitative measures of research impact include counts of how often and where one's work is cited. Indeed, how often to cite oneself is a vexed issue for scientists (Cooke & Donaldson, 2014). We see this in the Committee on Publication Ethics (COPE, 2019) document "Citation Manipulation," which notes not only that "when articles are found to contain references that do not contribute to the scholarly content of the article and have been included solely as a mechanism of increasing citations, the result misrepresents the importance of the specific work and the journal in which it appears," but also that "not citing relevant previous work may result in allegations of self-plagiarism or redundant publications." Clearly, in-text citation for TR is an ethically complicated matter for STEM researchers.

5.2 Notes or other annotations for readers

The standard practice of quoting in many academic documentation styles accomplishes three distinct tasks: the citation gives the source of the material, the quotation marks alert readers to the presence of "borrowed" material, and those marks also identify the specific material. But with TR, there are no established mechanisms for announcing its presence; as we explain above, citation alone does not accomplish this. If the normal mechanisms for citing the sources of text through

in-text citation are not satisfactory for making TR transparent, another option for Dr. Agarwal is including some kind of note to the reader that explains how text was recycled in the manuscript. This has its appeal, since it shows an earnest effort at transparency and might eliminate additions to the text that would be confusing or distracting. Dr. Agarwal must then decide whether to *announce* the presence of recycled text or *mark* exactly which material is recycled or both – and also whether this should be done for editors only during the editorial process or in the manuscript itself for eventual readers. In Dr. Agarwal’s case, she might place a note at the beginning or end of the article that reads, “Portions of the Introduction and Methods of this article that do not substantively relate to the novel findings presented here are recycled from previous work published by the Agarwal Lab.”

Perhaps a time will come when such a note will be considered sufficient, but the research from our TR project suggests that currently it would not be acceptable to many editors, peer reviewers, and readers, who would want to know: How many portions, and of what length? Where do these passages begin and end? From what sources are the passages drawn? Why have they been recycled? To answer these questions in a note would require a lengthy explanation, and to designate the recycled text somehow – for example, with italics – could be confusing. Even if such practices were to be developed, we suspect most readers would find such annotated texts distracting. After all, Dr. Agarwal is recycling passages that do some of the necessary work required by scientific communication: establishing the context of the research and relaying common methods. The point is to do this work efficiently and clearly, and to avoid wasting researchers’ time. An elaborate system of notation for TR works against the goal of avoiding such unnecessary labor or loss of precision.

6. Composing STEM articles that avoid TR

During her graduate studies, Dr. Valdez, our second fictitious case subject, was told by a research administrator in a Responsible Conduct of Research training that TR should be avoided. She accepted this guidance and decided that she does not want to recycle text between journal articles in the writing done in her lab. (Whether the lab, when writing journal articles, recycles materials that come from other sources – e.g., the group’s grant proposals or its conference presentations – is another matter that we are setting aside for the time being.) What alternatives to TR can Dr. Valdez use when she finds that she needs to repeat similar information across journal articles?

6.1 Rewording and patchwriting

Many STEM researchers are aware of editors' and publishers' widespread use of iThenticate, a tool that checks research manuscripts for plagiarism. Our discussions with editors suggest that iThenticate is often the way that TR is discovered during the review process. Dr. Valdez wants to make sure that the parts of the Introduction and Methods sections that are similar across her papers will not seem to editors to be recycled. So she runs a final draft of every paper through iThenticate before submitting it. If any passages are flagged that point back to her own published work, she makes simple changes to differentiate the texts without changing their meaning. This may involve turning verbs into nouns, exchanging words for their synonyms, changing the syntax of sentences, or even changing units of measurements. In reviewing the literature for examples of TR, we have seen all these strategies.

In this case, Dr. Valdez allows iThenticate to define what TR is, and she makes superficial changes to the text to satisfy the algorithm. She does not intend to hide anything about the way the texts were written, but rather to use iThenticate as a guide toward avoiding what she has been told is an unacceptable writing practice. In this way, we see how the tail wags the dog, as iThenticate, a tool that should be used to help researchers reach the ethical writing standards that they have set for communication in their fields, becomes a generator of those standards.

Furthermore, Dr. Valdez is now treading close to another problematic writing practice: *patchwriting*. Howard (1992) developed this term to describe a practice that commonly occurs when student writers try to paraphrase a text they do not yet fully understand well enough to write about. Patchwriting is "copying from a source text and then deleting some words, altering grammatical structures, or plugging in one-for-one synonym-substitutes" (Howard, 1992, p. 233). To be clear, Howard's patchwriting is a practice on the plagiarism spectrum (though she wishes to distinguish it from plagiarism), as it involves unacceptably close use of another writer's syntax or language. But what Dr. Valdez is doing in rewording her own writing for iThenticate is a curious practice we might call "self-patchwriting."

Finally, rewording similar ideas across texts may lead to confusion among readers or loss of accuracy from an original text. If Dr. Valdez is changing the units of measurement across different articles, for example, she is making her work less clear. Many other such textual and syntactic changes may not serve the goal of clarity of communication. Rewording, a practice in which we believe many STEM writers engage, seems in many cases to be a writing practice that is following the letter of the law but not its spirit, with few beneficial effects for communication of STEM research.

6.2 Omit and point back to previous work

Perhaps at some point, Dr. Valdez would find herself feeling unsure about the rewording, or “self-patchwriting,” approach. She might decide that a better approach is to omit repeated material and instead point readers back to the relevant passages in previous work with a citation and some context. For example, she might omit methodological details about priming the yeast and instead write: “We primed the yeast using the same protocol that is explained in detail in Valdez et al. (2018).” For a literature review passage on the early work on CRISPR/Cas-9, she might write, “For a review of the early research on CRISPR/Cas-9, see p.45 of Valdez et al. (2019).” This approach avoids some of the problems elucidated above and saves space (though it does again raise the problem of frequent self-citation as a suspect practice), but many editors are likely to insist that the new article should stand alone. One biomedical engineering journal editor we interviewed argued that although many aspects of a paper are the same across publications, they must be repeated in each paper so that it is self-contained:

The equation will be the same, the definition of variables will be the same. To a great extent, the description of the model will be the same. The motivation in that case [for repeating the same information] is the fact that you have to establish the baseline understanding of that model for the audience. In the majority of [the] publications, we would say that each paper needs stand on its own.

As Gilliver (2012) notes in his guidance to medical writers about TR, references back to previous articles of this kind increase the burden on a reader, who has to locate and navigate other publications to understand the present work. More importantly, since many of these articles are behind paywalls, they may be difficult or costly for some readers to access. Also, this approach to repetition across STEM writing would result, over time, in articles that might be full of such references, as a researcher points back to work done over a substantial grant or even a career rather than repeating that information in subsequent work. As we have seen with other strategies for either employing or avoiding TR, this one is far from satisfactory.

6.3 Consult the guidelines

Let us now imagine that Drs. Agarwal and Valdez, unsatisfied with or unclear about their options as described above, decide it is best to consult journal guidelines or policies in their field. Unfortunately, the lack of clear norms for TR attribution in STEM is reflected in – and perhaps driven by – ambiguities and inconsistencies among (and sometimes even within) official TR guidelines and policies. Suppose that each author wishes to publish their next paper in one of

the journals of the American Chemical Society (ACS). If they consult the ACS's Ethical Guidelines to Publication of Chemical Research, they will be told, "Material quoted verbatim from the author's previously published work must be placed in quotation marks" – that is, no recycling allowed. But if they instead look to the ACS's author-publisher contract, they find that as long as they cite their prior work, authors "may reuse ... text extracts of up to 400 words ... from the Author's ... Published Work ... in subsequent scholarly publications of which they are an Author." Or they might have found the editorial published in the ACS's *Journal of Medicinal Chemistry*, which states that when describing "procedures and equipment ... it is acceptable to reproduce language for these items in the experimental section." Or, hoping to publish in the ACS publication *Analytical Chemistry*, they find a different editorial in that journal, this one instructing authors to "show off your writing skills by rewriting every single part of your manuscript each time you submit your work. This is not only a suggestion; it is a requirement."

7. Discussion and conclusions

It is tempting to view the problem of TR as a purely textual one, involving decisions about which words can be recycled across publications (methods? literature reviews? analyses?); how many such words can be appropriately recycled (a sentence or two? a paragraph? a section?); which genres or contexts can be the source and destination for recycled material (a conference paper or poster or grant proposal to a peer-reviewed journal article?); what kinds of linguistic manipulation are appropriate (simple rewording? patchwriting? paraphrasing?); and what peripheral devices might permit TR (footnotes? endnotes? explanatory self-references?).

But TR, as our research is making clear, also involves many social-psychological dimensions of composing that extend beyond but are intricately intertwined with how a researcher textually conveys original inquiry to readers for the purpose of advancing knowledge, and how the myriad decisions of composing are determined in part by the norms and practices of particular discourse communities. "Ecological" theories of writing suggest that writers are negotiating what Smidt (2002), drawing on the work of Bakhtin, calls "discourse roles and positionings." Discourse roles refer to "the discursal presentation of selves offered by culturally patterned ways of writing" – for example, representing oneself as a scientific researcher by using field-specific language conventions. Positionings refer to "unique and always changing stances within these roles and genres" as they relate to readers and the form, topic, norms of discourse (p. 424) – for example, deciding whether to point repeatedly to one's prior research and publications.

As we have illustrated in our researcher scenarios, the TR-related choices facing scholars as they write up the results of their research significantly complicate our received models of the writing process in the context of roles and positionings. These complications originate in tensions among murkily defined “rules” for the reuse of text; desires (and even requirements) for accuracy and efficiency; the ease of reuse afforded by technology; personally variable concerns about self-representation (appearing self-promoting or padding one’s c.v.); perceptions of ownership relative to copyright restrictions (e.g., recycling text from a journal that gives copyright to the author vs. one that does not); fears of impropriety without explicit knowledge of what’s appropriate; and unwritten conventions of collaboration, such as recycling text from an earlier publication that included one or more other authors.

While some norms of discourse can be inscribed in such a way that authors face none of these tensions (for example, there is a single way to follow the form of the American Psychological Association’s reference system), TR does not admit to such stability. At a high level of what we can consider to be the “scientific community,” it might be impossible to decide collectively on a set of “rules” for TR. Such an effort would likely encounter a variety of opinions about the practice and appropriateness of TR, as our interviews have demonstrated. The rules would still have to vary across different disciplines and subdisciplines within the broader community, and perhaps – as it appears now – within specific contexts such as individual journals. However, as is true in all communities of practice, the conventions and norms of written communication continue to evolve, placing upon writing researchers the need to take a longitudinal view of the way that text conveys and mediates new knowledge. In the meantime, scholars continue to grapple with decisions about TR that further complicate the difficult process of attribution and citation.

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