

REDUCING SUBORDINATE CLAUSES IN THE INTEREST OF JOURNAL STYLE

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Academic writing, particularly juried articles, often compresses information in noun phrases that might have otherwise been delivered through subordinate clause structure. Graduate students under increasing pressure to publish in refereed journals often require support drafting their writing in this way. The purpose of this paper is to report on a small study focusing on the development of skills that reduce subordinate clauses and expand noun phrases. Findings indicate that three one-hour interactive presentation-practice sessions produce significant results on immediate and delayed posttests. Moreover, preliminary analysis of reflections from participants was unanimously in support of learning the skill. Future research in this area might explore individual learner differences reflected in learner trajectories in a scaled-up study (i.e., longer in duration and including more participants).

Keywords: academic writing, noun phrase, relative clause, white English

This paper reports on a small fast-response quasi-experimental classroom study aiming to reduce relative clauses, as they are one aspect of academic writing that has troubled my applied-sciences graduate students in their otherwise bright scholarship trajectories. Indeed, graduate students are under increasing pressure to publish in academic journals during their master's studies (Alvarez, Bonnet, & Kahn, 2014; Patton, 2013). While their experimental and theoretical ideas may potentially add new knowledge to their fields, negotiating academic journal styles might hamper their chances at publication, and the double-blind peer review process can be a hurdle for some. Moreover, while speakers of Standard U.S. or British English may have trouble adjusting, it may be even more difficult for speakers of additional languages of English to master a very specialized style at the earliest stages of their graduate study and scholarship. Yet, adjust or perish seems to be an unwritten rule.

Indeed, some academics may view this as a rite of passage, despite or because of the obvious linguistic and cultural hegemony. Otherwise, a progressive-thinking, inclusive, and multicultural perspective seems lost on some university professors when it comes to writing style. It is disturbing that initial stressful and micro-aggressive experiences might even cause bright early academics to leave their fields of study. While they may find fulfilling futures elsewhere, there is no telling how much excellent research does not take place—or if it does, does not get published due to academic writing apprehensions. Even humanity itself loses something in its quest for new knowledge to solve seemingly intractable questions and problems because of the stressfulness of writing for the academy. This is as true across the applied and human sciences as it is in the humanities.

Many of my students have often deployed a style rich in subordinate clause use. It is not clear if they were explicitly taught to do this, although courses in academic English often teach this as well as the avoidance of nominalizations, or what some call “zombie nouns” (see Sword, 2012). Example 1 presents an original sentence with three relative clauses; its revision presents compressed information in the noun phrase and no relative clauses.

Example 1.

Subordinate Clause Reduction and Noun Phrase Expansion

Original sentence: Mutations that are predicted and that are underrepresented demonstrate resilience especially within sequencing that is iterative.

Revised sentence: Underrepresented predicted mutations demonstrate resilience especially within iterative sequencing.

The revised sentence in example 1 compresses information into two robust noun phrases: “underrepresented predicted mutations” and “iterative sequencing.” In this revision, the three occurrences of the relative pronoun “that” have been removed. While research exploring why the academy seems to prefer the use of robust noun phrases in its academic journals has not been conducted, it reflects and constitutes parsimony, a known value in scientific thought and reflected in its written reports. The revised sentence in example 1 uses fewer words to express the same ideas as the original sentence and thus can be said to be a parsimonious expression when compared to the original sentence. Moreover, it aligns with the construction of an object of study—a fixed variable, which research frequently favors—rather than a process (Halliday & Martin, 1993).

Example 2 illustrates a similar shift of information through noun phrase expansion and subordinate clause reduction. In this example, two relative pronouns and two copulas (“was”) have been removed. The value of a parsimonious style is highlighted.

Example 2.

Subordinate Clause Reduction and Noun Phrase Expansion

Original sentence: Findings demonstrated Cs changed to a bond that was metallic at a deposition time that was 200s.

Revised sentence: Findings demonstrated Cs changed to a metallic bond at a 200s deposition time.

In the past I had often counseled students to vary the length of their sentences, suggesting it increased reader interest. Assuming long sentences tested a reader’s working memory, short ones would provide working memory respite. The combination, I theorized, might generate a user-friendly text that allows readers to glean as much information from expository journal writing in the shortest time. My students often accomplished varied length at my prompting, but until recently, I never thought to instruct varied relative clause use.

In example 3 the noun phrase in the original sentence is “SodA”—one word. It is followed immediately by a relative clause “that is detoxifying.” The revised sentence in this example has “detoxifying” in front of “SodA,” thereby compressing information into the noun phrase and removing the relative pronoun “that” and the copula “is.” The revision generates easier reading in this instance through decreased clausal complexity (Biber & Gray, 2010).

Example 3.

Subordinate Clause Reduction and Noun Phrase Expansion

Original sentence: SodA that is detoxifying is a ubiquitous metalloenzyme in aerobic bacteria.

Revised sentence: Detoxifying SodA is a ubiquitous metalloenzyme in aerobic bacteria.

Example 4 illustrates a similar noun phrase expansion from one to two words. A relative clause and a copula disappear from the revision.

Example 4.

Subordinate Clause Reduction and Noun Phrase Expansion

Original sentence: Filaments that are algal often remain under-identified and prey-sources even more so.

Revised sentence: Algal filaments often remain under-identified and prey-sources even more so.

In the next section I briefly review the literature on conversation and academic writing register because these issues relate to the way I eventually constructed my small fast-response study.

Literature Review

Early studies by Halliday (1985) and Biber (1988, 1995) frame the differences between written and spoken forms of a dominant discourse in terms of organizing principles, lexical items, economies of expression, and complexity. In those studies, academic writing is characterized as organized, always exhibiting greater low-frequency lexis and utilizing a curtailed use of personal pronouns compared to conversational speech.

More recent work has explicitly emphasized nominal complexity, suggesting academic writing often exhibits a compression of information before main verbs (McNamara, Crossley, & McCarthy, 2010). It also shows that an increase in information in noun phrases correlates to a decreased clausal complexity (Biber & Gray, 2010). Moreover, they assert, the nature of complexity is different for speaking and writing: The former complexity is clausal; the latter is phrasal (see example 1 above). They also posit that compressing information in noun phrases increases ambiguity, noting it might generate great confusion with graduate students and additional language speakers of academic English with reference to reading comprehension.

Their analysis of academic writing is based on comparing information from a corpus of academic writing (3 million words) and one of spoken American English conversation (4.2 million words). The academic writing was from "science/medicine, education, social science (psychology), and humanities (history) journals, together with a smaller corpus of textbooks (760,000 words) and course syllabi (52,000 words)" (Biber & Gray, 2010, p. 4). The texts were from "three 20-year intervals (1965, 1985, 2005)" (p. 4). Curiously, pre- and post-nominal modifiers are highly frequent in academic writing, whereas dependent (or subordinate) clauses are less prevalent; the opposite is true of speech. They point out that elaboration is phrasal for academic writing and clausal for everyday conversation.

In terms of this study, clausal elaboration, whether the application of prior direct instruction in clausal structures or simply the extension of speech practices, might be addressed by an interactive demonstration practice approach that focuses on reducing the number of dependent clauses in a text and expanding prenominal elaborations (research questions RQ1 and RQ2):

RQ1: What are the effects of an interactive demonstration-practice approach on editing subordinate clauses?

RQ2: What do students report about the approach?

Participants

The participants ($N = 21$) in this study were ages 23 to 27 (mean age 25) and recruited from an intensive English program (IEP) for students pursuing master's and PhD degrees in a university for graduate studies in the Middle East where English was the medium of instruction. Recruitment took place during the first meeting with the IEP students, in which the students were invited to consider participating in a research study on academic writing instruction. They were informed that participation was voluntary and had no effect on evaluations of their progress in the course. They were also informed that they could decide to join the study and drop out of the study at any time without having to state any reason and that such a decision would not influence any evaluation of their progress in the course.

All participants spoke Arabic as their first language. The mean International English Language Teaching (IELTS) score was 6.5. All were attending a five-week intensive English course in academic English immediately prior to their academic studies. Following the course, two-thirds of the participants attended additional noncredit-conferring courses in academic reading, writing, listening, and speaking that they volunteered for or were encouraged or required to attend based on their progress in the initial five-week course. Approximately half of the participants continued to avail themselves of the intensive English program through self-initiated tutorial sessions, usually to support their academic writing (e.g., to receive feedback on drafts for conference and journal papers and abstracts and for thesis and dissertation proposals).

Method

The study consisted of two parts. The first part was quantitative: a small fast-response quasi-empirical quantitative examination of the research questions with a pretest, an immediate posttest, and a delayed posttest design. Timing of the design sequence included three one-hour interventions over three consecutive days bracketed by pre- and immediate posttests, the former on the day immediately preceding intervention days and the latter on the day succeeding intervention days. The delayed posttest was conducted one week after the immediate posttest. Scores were analyzed using a t-test.

Prior to the study, participants were randomly assigned to experimental ($n = 14$) and control ($n = 7$) cohorts that remained intact throughout the entire duration of the study. Each cohort was administered the same three tests at the same time.

The experimental group received the treatment on intervention days and the control cohort did not. Instead, the control cohort performed text-based interactive activities with model academic texts (i.e., texts that represented multiple examples of nominal complexity with fewer examples of clausal complexity) on intervention days. For this group, there was no conscious, direct, or explicit instruction on how to reduce dependent (or subordinate) clauses and restructure the information in a noun phrase. The reduction of clauses and restricting of information in noun phrases was conducted only with experimental cohort participants, who were providing the control cohort with some instruction in editing.

The experimental cohort received texts that were seeded or flooded with a high degree of clausal complexity, and through interactive sessions that included think-aloud and trial-and-error interactions; the texts were changed so that clauses were reduced and nominal complexity was increased. By the end of a one-hour editing session, participants in the experimental cohort had texts like those used in the

control cohort. All tests were designed and piloted prior to this study with different participants who matched the profile of the participants in this study. Piloting the texts was done with reading-comprehension questions, indicating that English-Arabic glossaries of complex lexis for each text would facilitate text comprehension; hence, these were provided to both experimental and control cohorts. Glosses of lexis were provided on texts for all tests, interventions, and control group tasks.

The second part of the study was qualitative. Participants were requested to write a reflection on the value, if any, of what they had learned. Reflective writing took place on the day following the delayed post-test for the experimental cohort. The control cohort wrote their reflections following three one-hour sessions across three days to learn editing after the completion of part one of the study in compliance with fair and ethical research practices for control cohorts. The reflections were analyzed through an iterative process of reading, rereading, and coding ideational units, followed by grouping these under concepts that were discovered in the reflections themselves.

Results

This study examined the role of an explicit instruction and practice model of editing skills that focused on moving information from subordinate clauses to noun phrases in adherence to academic journal style. Results of raw scores on the pretest were not analyzed because zero points were awarded, indicating that editing skills of the level under consideration had not been developed prior to this study for either experimental or control group participants.

Table 1 reports the results of the immediate posttest. It shows that an independent-samples t-test was conducted on scores from an immediate posttest that was given one day after editing skills were explicitly provided to the experimental group and compares those to the control group, which was not instructed in editing skills but simply interacted with texts in journal style. There was a significant difference in the scores for explicit instruction of the experimental cohort ($M = 61.2143$, $SD = 12.3673$) and the lack of explicit instruction in the control cohort ($M = 30.4657$, $SD = 26.2107$) conditions; $t(19) = 3.7040$, $p = 0.0015$. Such results suggest that explicit instruction of these editing skills does have an immediate effect.

Table 1 T-Test Results for Immediate Posttest

Cohort	Control	Experimental
<i>Mean</i>	30.4657	61.2143
<i>SD</i>	26.2107	12.3673
<i>SEM</i>	9.9067	3.3053
<i>N</i>	7	14

Notes: The two-tailed P value equivalent: 0.0015; the mean of control group minus experimental equivalent: -30.7486 ; 95% confidence interval of this difference from 48.1237 to -13.3735 ; intermediate values used in calculations: $t = 3.7040$; $df = 19$; standard error of difference = 8.301 .

Table 2 reports the results of the delayed posttest that was conducted one week after the immediate posttest. These results also indicate a significant difference for explicit instruction ($M = 86.5271$; $SD = 12.0445$) compared to the lack of explicit instruction ($M = 34.550$; $SD = 21.9389$) in control and experimental conditions, respectively; $t(18) = 6.9238$, $p = 0.0001$. Such results suggest that explicit instruction of these particular editing skills does have a delayed effect that strengthens the immediate posttest results.

Table 2 T-Test Results for Delayed Posttest

Cohort	Control	Experimental
<i>Mean</i>	34.3550	86.5271
<i>SD</i>	21.9389	12.0445
<i>SEM</i>	8.9565	3.2190
<i>N</i>	6*	14

Notes: *One participant was absent. The two-tailed *P* value was less than 0.0001; the mean control minus experimental cohort equivalent: -52.1712; 95% confidence interval of this difference from -68.0030 to -36.3413; *t* = 6.9238; *df* = 18; standard error of difference = 7.535.

The results of the preliminary reflections were unanimously in favor of the explicit instruction of editing skills that support increasing nominal complexity and decreasing clausal complexity in the rendering of academic journal style. As one participant wrote, "I never understood this before. After all the corrections of tense, spelling, and punctuation, I still thought something was missing from my writing. Now I can change that too. This makes me very happy." Another wrote, "Learning this is an eye-opener. It makes me a professional." And from a third: "I feel like I am becoming a stronger writer. I can fix my writing to please journals."

Discussion

The experimental cohort intervention began with me as teacher-researcher writing a dependent clause on the whiteboard (e.g., "studies that are descriptive") and asking students to discuss with partners ways to say the same thing with fewer words. Next, students were asked to share their ideas with the whole class. I wrote these responses on the whiteboard and asked if any other editing might be done. Where mismatches occurred, the class was asked to reformulate a fellow classmate's phrasing; where this was not possible, I provided the recast.

Each class began with simple examples and ended with more complex ones (e.g., "policies that are for immigrants and that are restrictive"). In all cases, since the participants were graduate students in a variety of disciplines (e.g., marine biology, applied mathematics, physics, nanotechnology, electrical engineering, environmental science), topics were selected that were not from these disciplines so as not to advantage one group of students over another. Experimental cohort participants were also given paragraphs with many clauses and asked to reduce as many as they could; provisions of time were made for comparing the correct versions with participant-edited ones as well as provisions for any questions students might have. Participants worked with partners or independently during each session.

Over the course of the three interventions, students gained confidence. By the second day (second intervention), I asked participants when this style *might not* be appropriate. Nontechnical writing was then discussed. Paragraphs from the science sections of the *Guardian* and *The New York Times* were used to show that in nontechnical writing subordinate clauses predominated. I asked which style was better while encouraging them throughout to develop criteria for "better." I focused on contrasting the value of parsimony with clarity. Examples were discussed where parsimony was ambiguous and where clarity was less parsimonious (example 5).

Example 5.
Subordinate Clause Reduction and Noun Phrase Expansion

- (a) Feedback that is about conversation affords second language development.
 - (b) Conversational feedback affords second language development.
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The expansion of the noun “Feedback” to the noun phrase “Conversational feedback” creates a shorter sentence, thereby not only meeting a value of parsimonious expression in journal writing, but also creating ambiguity for novices to this subject and for L2 students. “Conversational feedback” could mean feedback delivered in a conversation about anything or it could mean feedback about the conversation itself.

I also wrote example 6a on the chalkboard for my students. I asked them to discuss the sentence with a partner and clarify the noun phrase “Sunni bigotry.” The class was divided on whether it meant bigotry against Sunnis stemming from others or bigotry from Sunnis against others. I then wrote example 6b on the chalkboard, and asked students to discuss what was gained and what was lost in this rewrite. Students suggested 6b added clarity by expanding the length of the sentence with a relative clause. They hastened to add, however, that compressed information in a noun phrase was lost. I pointed out that this would be a tension running through much academic journal writing (Biber & Gray, 2010).

Example 6.
Exploring Ambiguity

- (a) Recent research from transcripts of discussions at the United Nations explores Sunni bigotry.
 - (b) Recent research from transcripts of discussions at the United Nations explores bigotry that others express against Sunnis.
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I summarized this discussion by suggesting that students avoid the label “better writing” when comparing journal styles with other styles. Learning to manipulate styles was perhaps a key to a deeper understanding of the socially constructed use of style and its intersection with power, in this case as represented by top-tiered research journals and the styles that predominate there. While as reported above all of the reflections on this intervention were positive, a few examples clearly stated that academic writing was better for them. One student wrote, “Now I can write in top style. I’m happy.” Another student reflected, “I can make my writing superior.” A third student opined, “Research writing is better writing and I will make mine like it. Thank you.”

In future classes, it may be worthwhile to spend more time on the role of value judgments about writing. Even though I provided examples of the ambiguity that possibly arises from relative clause reduction and noun phrase expansion, a few students still did not understand this point judging from their reflections. Either I did not provide enough examples or my examples were not well understood. My care not to bias the study in favor of one field or another that my students were studying may have had something to do with this as well.

Perhaps some students did not link the ambiguity I illustrated to examples in their own field of study. In other words, perhaps their lack of familiarity with my examples made it difficult for a few students to link my examples to their own disciplines. In future, I may ask students to illustrate ambiguity with examples from a journal paper from their field and share their own examples with the whole class. This will create a lengthier intervention, but I do believe this might further internalize in students a deeper understanding of academic writing—both their own and others’.

Nevertheless, this research indicates that the explicit instruction of editing skills to reduce the number of dependent or subordinate clauses and increase the size of noun phrases for the sake of producing the required journal writing style is a promising intervention or practice. Through an interactive demonstration think-aloud practice approach conducted over three separate one-hour sessions on three consecutive days, participating second language writers shifted one aspect of writing so that it aligned with current practices in academic journals.

Moreover, according to preliminary analysis, participant reflections collected at the conclusion of the study unanimously supported the intervention, including reflections from control cohort participants after their instruction following the delayed posttest.

Conclusion

Parsimonious expression is frequently favored by science in its paradigms, models, theories, and hypothesis. Recent research has indicated that compressed information in noun phrases often results in a more parsimonious writing style than an extended use of relative clauses. Nevertheless, it does conflict with the value of clarity of expression, which is also valued by science (see examples 5 and 6). A growing body of research supports the development of interventions for graduate students and additional language users of English for academic purposes, particularly on noun phrase development (Biber & Gray, 2010; Biber, Gray, & Poonpon, 2011; Parkinson & Musgrave, 2014).

Building on the above discussion of parsimonious style versus clarity, one area that might be researched is the extent to which the preference for compressed information in noun phrases generates ambiguity, thereby setting up an asymmetrical relationship to clarity in academic journal style. Questions to be pursued in such research might determine whether greater or lesser ambiguity is generated by robust noun phrases in particular fields of study (e.g., in history, physics, cultural studies, linguistics, microbiology, anthropology, and education). This area of research could use the large and growing electronic corpora as data sources.

As an alternate, a study might follow a cohort of second language graduate students as they negotiate their adoption of aspects of academic writing such as those in this paper as well as additional ones (e.g., nominalization, relative clause reduction, hedging, research discourse structure, inanimate subjects, and passive voice). A study such as this would look for durable linkages between instructional practices and learning trajectories as well as how students integrate different aspects of what they learn about journal writing into their own academic writing.

A study of the patterning of clarity and ambiguity might be a key to unraveling additional dimensions of discourse analysis with respect to journal style. The extent to which such asymmetries are on a continuum of, perhaps, compressed meaning and ambiguity at one end and decompressed meaning and clarity at the other might be explored.

Moreover, a future study might explore the effects of this intervention on providing feedback and receiving feedback when dyads engage in peer revision. It may be that once one has learned clausal reduction, editing the work of a peer improves the provider's skill more than—if not at least as much as—the receiver. Such a study would extend the role of editing significantly if a large enough sample size were utilized. Lundstrom and Baker (2009) provide some ideas on how this might be structured through their study, albeit not specifically related to clausal reduction and phrasal expansion.

In addition, a future study might elaborate on ways to advocate for a journal style that is trans-stylistic. A trans-style might include a variety of Englishes and different registers, not just for those that Rymes (2015) has aptly named White American Vernacular English (WAVE!) on her blog Citizen Sociolinguistics. Learning to manipulate styles is perhaps fundamental to a deeper understanding of the socially constructed use of style and its intersection with power, in this case as represented by top-tiered research journals and the style that predominates there. It was stressed in this paper's research that these

repertoires should not be seen as better but as powerful at this junction in history, suggesting that reality is in flux.

There are, in fact, journals, albeit not in the applied sciences, which have embraced a trans-stylistic discourse. For example, Smitherman (1973) deploys a mixture of hegemonic academic U.S. English and African-American English. Moreover, Canagarajah and Lee (2014) argue that “there is a new openness to alternative discourses in the academy” (p. 59). They model a narrative style that alternates between them as they discuss Lee’s mentorship by Canagarajah and their intention to, among other plans, “negotiate more boldly the diverse modes of representing research findings” (p. 60). Nevertheless, WAVE! (Rymes, 2015) or, as I might call it, Hegemonic Academic British or U.S. White English (HABE/HAUSE), seems to predominate even in the two journals that allowed trans-stylistics to be published. I was unable to find examples in the applied sciences, which only confirms Biber and Gray’s (2010) corpus linguistic research.

Finally, it is important to turn back to the study at hand in order to acknowledge its limitations. Chief among these are the small sample size, short duration, and lack of analysis of individual differences as well as the absence of an exploration of individual change/growth trajectories. Moreover, the qualitative findings are only preliminary. Future studies might address these issues squarely as well as explore individual change/growth trajectories among the non-explicitly-instructed participants. It is curious that a small number of participants from the control group did show improvement. Was it through trial and error? Did they talk to other experimental cohort participants, “polluting” the results? Is there a study waiting to be designed on implicit learning, based on exposure and interaction with model texts (see Williams, 2005)? Therefore, while there are some examples of what I might call a “trans-stylistic discourse,” not until journals take a bold step of embracing a trans-stylistic discourse as a foundational principle will change be anything but incremental.

In conclusion, the current study shows that graduate students in the applied sciences under increasing pressure to publish can be instructed in how to edit their research writeups to align them with the academy’s embrace of robust noun phrases and that students appreciate learning this. While these are preliminary findings, they are encouraging findings in our commitment to help our students advance and be recognized.

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