Journal of Response to Writing

Volume 8 | Issue 2 Article 4

December 2022

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Abstract: While a great deal is known about instructor response to student writing—from commenting practices to student perceptions—less is known about how feedback impacts students' writing and writerly development. While we set out to study students' explicit engagement with written instructor feedback, our initial experimental design was disrupted by the COVID-19 pandemic. Accordingly, we describe the dialogic collaborative process that emerged as we considered anew both the data we were able to collect and, in turn, feedback. This article proposes that feedback on student writing is a boundary object that affords those interacting with it the opportunity for collaboration despite the different languages, meanings, and priorities they bring to it. The results present an initial framework for theorizing feedback as boundary object, which includes (a) a linguistic comparison of the words used by instructors and students to talk about writing and (b) structural trends that

Harding, L., King, J., Bonanno, A., Powell, J. (2022). Feedback as Boundary Object: Intersections of Writing, Response, and Research. *Journal of Response to Writing*, 8(2), 73–105.

we have termed "dialogic infrastructures," describing the form and orientation of instructor feedback and corresponding student responses. We also share implications of this nascent theory for future feedback research and writing-classroom practices.

Keywords: boundary object, student engagement, feedback, collaborative processes, dialogic infrastructures

Author Note

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Writing studies have explored feedback on student writing for at least four decades, covering feedback types, instructor goals and priorities when providing feedback, students' feelings about feedback, and the role feedback plays in the writing process, the classroom, and students' development as writers (i.e., Ferris, 2014; Nicol, 2010; Pitt & Norton, 2017; Sommers, 1982). Initially, the research team envisioned contributing to this literature by studying the following research question: Does prompting students to explicitly engage with the feedback they receive on their drafts enhance student learning and writing? We wanted to know if nudging students to do more than simply read feedback would help that feedback shape students' development as writers. We hoped to see evidence of these changes in students' final drafts and end-of-term reflections. To this end, we developed a mixed-methods approach to investigate student engagement with feedback.

Unfortunately, our study's experimental design was compromised by the COVID-19 pandemic. Participating classes pulled out of the study, and the classes that remained only completed one of three planned cycles of student writing, instructor response, and feedback engagement. In addition, while some student participants completed a presurvey, only one

student completed the end-of-term survey. When we returned to the data we were able to gather, we realized that our original analysis plan could no longer be completed. Rather than scrap our limited dataset and run the study again, the research team began to meet regularly to discuss what we could learn from our data and how we might revise our experimental design so that a future study might address our original research question more successfully.

What emerged from these conversations, however, was not a new and improved study design; rather, the team began to see feedback differently. We no longer considered feedback as comments with which students needed to more meaningfully interact. Instead, we realized that our original hypothesis—that if students are asked to engage with feedback on their writing, the feedback they receive will help them revise their drafts and grow as writers—did not provide a full enough picture of feedback and interactions involving feedback. For even when asked to engage with feedback through a series of reflection questions, some students, we found, maintained a certain way of talking about writing and a certain set of strategies for engaging feedback. That is, they seemed to filter feedback through an established vocabulary and action framework—their "terministic screens" (Burke, 1966). Feedback, in turn, did not motivate learning; it acted more as input to be processed through students' existing schemas. So we approached feedback as a dialogic process involving the teacher and student in the margins of a project, and we found ourselves asking a number of questions: What forms does this dialogue take? Between the teacher and the student, whose priorities drive the dialogue? Who sets the terms? From whom does the exigency arise—or who is responding to whom?

These questions and our changed perspective led us away from an approach to feedback that focused on students, teachers, or the comments themselves—or even feedback as a simple back-and-forth exchange. Instead, feedback emerged for the research team as a "boundary object" (Star & Griesemer, 1989), an interactive space in which words

and actions—and deeper still, meaning and motivation—are explored and negotiated to facilitate collaboration (or not). In this paper, we will consider feedback as a set of responses (e.g., an instructor responding to a student's draft, a student responding to an instructor's comments, an instructor responding to a student's revisions, etc.) that function as a boundary object: a distinct object that takes on slightly different and malleable meanings depending on the stakeholder group interacting with it—while also allowing for shared use. We deploy this concept to describe how feedback is used by students and teachers. What began as an experimental study on feedback engagement ultimately became a meditation on feedback, emerging through a rich, ongoing dialogue among research team members.

Introducing Dialogic Infrastructures

Once we began to see feedback as a boundary object, we wanted to understand how students and teachers interacted with it and with each other. In turn, this curiosity led us to conceive the term "dialogic infrastructures" to refer to patterns involving feedback, characterized by what was driving the interplay: the student, the teacher, or the interaction between them. While these patterns emerged during our analysis, we noticed similar drivers in the existing literature on feedback and thus identified four main research streams, characterized by what aspect of feedback was driving the research: the comments themselves, the teacher, the student, or interactions between them. Throughout our paper, then, we rely on a similar set of labels to show the relationship between the literature and the current study and to ultimately characterize interactions with feedback both in prior research and in the classroom. Developing a theory of feedback as boundary object at once aligns the feedback literature with feedback engagement and suggests that instructors should make explicit for students the boundary that runs alongside student writing. In turn, feedback can become a space in which instructors and students can collaborate despite their linguistic and semantic differences, despite their different motivations

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regarding the text, and despite the different discourse communities and social worlds they occupy.

Literature Review

Feedback on Student Writing

In reviewing the literature on feedback as response to student writing, we identified four main research streams, as noted previously.

Comment-Driven Feedback

The first stream focuses on feedback itself: the types and characteristics of comments instructors compose (e.g., Connors & Lunsford, 1993; Hyland & Hyland, 2001; Sommers, 1982), the aspects of student writing that commentary focuses on (e.g., Brannon & Knoblauch, 1982; Williams, 1981; Wall & Hull, 1989), and the parameters around written feedback, such as when it is provided (Kulik & Kulik, 1988), the form it takes (Batt, 2005; Calhoon-Dillahunt & Forrest, 2013), and its delivery method (Rawle et al., 2018; Sopina & McNeill, 2015). At the heart of this stream, we located the foundational work of scholars who identify and describe response procedures and strategies (e.g., Brannon & Knoblauch, 1982; Daiker, 1999; Elbow & Belanoff, 1989; Sommers, 1982; Straub, 1996). Ultimately, this body of work seeks to identify best practices for responding to student writing and to understand how feedback contributes to students' writing processes, writing performances, and development as writers.

Teacher-Driven Feedback

The second research stream centers on the teacher. The lens shifts to consider the following array of topics: instructors' motivations when responding to student writing (I. Lee, 2008); their roles—from reader and coach to copy editor and evaluator (Reid, 1994); the goals, philosophies, and training that guide their feedback practices (Ferris, 2014); their commenting styles (Straub, 1996); their execution of response strategies (Ferris, 2014); their workload (Baker, 2014); and their evaluations of their own feedback (Montgomery & Baker, 2007). A key theme in this research

stream is the disconnect between what instructors say or think they are doing when responding to student writing and the feedback practices they utilize. For instance, Ferris (2014) reported a lack of consistency between how instructors talk about feedback and the practices they employ in their classrooms, calling for more training and reflection on response strategies. For Montgomery and Baker (2007), this disconnect emerged in the context of instructors' attention to local, sentence-level issues in written feedback: While teachers thought they were focusing more on higher-order concerns in their commentary, they tended to focus instead on local feedback.

Student-Driven Feedback

Meanwhile, the third research stream directs attention to students and their experience with feedback on their writing. This stream covers what types and characteristics of feedback they want (Blair et al., 2013), whether they are reading comments (Cunningham, 2019), how feedback influences their views of writing (Ferris, 1995), what they think and feel about the comments they receive (Ferris, 1995; Pitt & Norton, 2017), and how they actively construct and respond to the feedback they receive (Nicol & Macfarlane, 2006). While instructors may wonder if their students are reading their comments, the literature suggests that they are, especially top-grade earners (Cunningham, 2019). In addition, students often perceive feedback as helpful (Ferris, 1995) and even essential to their learning and skill development (Winstone et al., 2016). While this research offers a robust portrait of how students perceive feedback, its reliance on students' self-reported perceptions and assessment of the impact of feedback limits investigations into addressing the role feedback plays in students' writing processes and writerly development.

Interaction-Driven Feedback

When researchers shift their focus to feedback as an activity, they identify feedback as a complex back-and-forth process. For instance, Kang and Dykema (2017) found that "creating a dialogue between students and instructors through responses to teacher feedback will enable students'

engagement in the writing process" (p. 29). For Perpignan (2003), this process defied attempts to locate trends in types of feedback or student experience; rather, "teacher-written feedback was perceived by and acted upon by the language learners, as individuals and as a group, in such diverse ways, and with such complex dynamics, that no understanding of the feedback dialogue presented here could be brought to serve any useful purpose" (p. 271). Indeed, Sommers (2006) reported a similarly complex conclusion from her longitudinal study of undergraduate student writers at Harvard: "Feedback shapes the way students learn to write, but feedback alone, even the best feedback, doesn't move students forward as writers if they are not open to its instruction and critique, or if they don't understand how to use their instructors' comments as bridges to future writing assignments" (p. 255). These findings point to feedback as a nexus between student and teacher; its impact is reliant upon both. Nicol (2010), too, explored this dynamic further, outlining a holistic framework in which feedback is recast "as a dialogical and contingent two-way process that involves co-ordinated teacher–student and peer-to-peer interaction as well as active learner engagement" (p. 503). An interactive approach to feedback can be seen as well in studies that consider the relationship between feedback and instruction (e.g., Rutz, 2006).

The current paper builds on these research streams and considers feedback as a rich and complex boundary object that can facilitate or inhibit dialogic interactions on the boundary of student writing. Next, we consider the concept of boundary objects, a term coined by Star and Griesemer (1989) to describe certain objects (whether material or symbolic) that become keystones around which actors relate and work toward shared goals. We focus particularly on the educational applications of boundary objects and then explore how people can view feedback through the lens of boundary objects.

Boundary Objects

Sociologists Star and Griesemer (1989) observed that scientific workspaces, such as the museum analyzed in their case study, are composed of

diverse actors, each with their own knowledge and interests. Scientific progress, they argued, requires cooperation across these differences. These observations hold true for writing classrooms and the development of student writing. Yet how does cooperation occur without consensus? Star and Griesemer found that actors continually negotiate meanings between their social worlds and those of their collaborators and that these interactions are often structured around certain unifying keystones, which they term "boundary objects." Boundary objects "both inhabit several intersecting social worlds . . . *and* satisfy the informational requirements of each of them" (p. 393, emphasis in original). Boundary objects thus are recognizable across social worlds but may take on various meanings as actors engage them according to their own experiences, knowledge, and interests (Star & Griesemer, 1989). This dynamic is consistent with the second and third feedback research streams described previously, focusing respectively on how teachers and students approach and interpret feedback consonant with their own interests and experiences. In addition to interpretive flexibility, a boundary object has a structure that enables interaction with the object. It "[transports] a set of conventions, standards and norms indexed to a community of practices" (Trompette & Vinck, 2009, p. b). Thus, feedback is something instructors and students use within the structured space of the classroom, with all its conventions and norms.

In our case, we saw students and instructors negotiating the meaning of students' writing and the process by which it would develop within the boundary object of written feedback. Rather than a smooth flow of communication between interlocutors, we observed information forming pools, eddies, and backflows as students attempted to interpret and incorporate instructor feedback. In other words, we discovered that feedback was occupying a space intersecting two profoundly different social/professional discourses; thus, we found that feedback was a boundary object.

In educational contexts, boundary objects are crucial for understanding student learning, including attempts to understand how learning happens across social differences (Akkerman & Bakker, 2011; Chang & Kuo,

2021). Several research contributions have suggested that when boundaries remain implicit in education, they act as barriers to learning and cooperation in diverse spaces, blunting their productive and transformative potential (Akkerman, 2011; Buxton et al., 2005). This resonates with broader research about boundary objects that critiques their presumed productive function and suggests instead that boundary objects embody a dual potential to either facilitate or inhibit progress depending on context-specific meaning and social dynamics (Carlile, 2002; Fox, 2011). In educational contexts, researchers argue that tapping into the potential to learn through boundaries requires explicit dialectical engagement (e.g., discussing differing cultural models of what it means to be a "good student" or to do "good work"; Akkerman, 2011; Buxton et al., 2005; Jahreie & Ludvigsen, 2007). Such engagement can enhance learner success by maintaining, overcoming, or constructing boundaries (Akkerman, 2011). Our findings align with these studies and suggest that boundary objects can facilitate or inhibit students' writerly development.

While the writing studies literature does not identify feedback as a boundary object, some descriptions of feedback gesture toward this perspective. For instance, Sommers (2006) emphasized that collaboration is the heart of feedback. This "partnership between student and teacher" in turn leads to the creation of a separate "language and meaning" for feedback, distinct from individual teacher and student vocabularies (p. 255). In this quote, Sommers points to the linguistic and semantic negotiation that feedback necessitates to maintain collaboration. Nicol (2010) argued that feedback should be viewed not as a unidirectional flow of information from teacher to student but "as a dialogical and contingent two-way process" (p. 503). Interaction is at the core of this approach to feedback and, as such, provided the occasion for Nichol to contend with the power dynamics and productivity of feedback, two central issues for boundary objects.

While these scholars mentioned ideas characteristic of boundary objects, fully investigating feedback as a boundary object offers a

productive shift in how we think about and attend to feedback in writing classrooms and in feedback research. This shift acknowledges the collaborative enterprise of learning about writing and considers anew how students and teachers engage with feedback in light of the social contexts, experiences, knowledge, and interests that inform that engagement. At the same time, viewing feedback as a boundary object offers a framework for exploring feedback holistically—the framework accounts for the student, the teacher, the normative and institutional context, the feedback itself, and related interactions and processes to consider how feedback works. This perspective also helps us first recognize how our feedback efforts can run aground and, more importantly, identify ways we might shift feedback boundary objects to their productive potential as interactive spaces that facilitate writerly development.

As the literature demonstrates, the boundary between instructors and students becomes visible in the distinct and myriad ways feedback is engaged, and, what is more, learning at this boundary does not require a uniform standard operating procedure. Indeed, the current project acknowledges the multiple, flexible deployment of feedback as a boundary object and traces it according to its language and infrastructure.

The methodology section presents the analytical approach we adopted that eventually led to theorizing feedback as a boundary object. We explain how we pivoted our investigation in light of pandemic disruptions and what organic, dialogic strategies we adopted in response to our data and our research team's discussions. We ultimately created two datasets: a set of corpora to investigate the language used by participating students and instructors and a set of assemblages of corresponding student and instructor texts we termed "feedback dialogues." Together, these datasets enabled our multidisciplinary research team to explore feedback from both horizontal and vertical perspectives, respectively.

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Methodology

We designed our study in fall 2019 for delivery in spring 2020, and our experimental design was straightforward. To study the effects of student engagement with instructor feedback, we planned to study pairs of writing-intensive class sections. We recruited three instructors of record, two of whom had teaching assistants, from different departments. Each instructor of record was teaching at least two sections of the same writing-intensive course. Altogether, our initial instructor participants included three faculty and two of their respective teaching assistants in a combined total of six sections across three departments. We included one of each instructor's sections in the control group and the other in the experimental group, though the instructors remained blind to this designation.

Following recruitment and IRB approval, we led a workshop on instructor feedback processes that encouraged participating instructors to reflect on their experiences with receiving and giving feedback, offered some scholarly sources on feedback practices, and suggested some practical approaches to giving students feedback on writing (e.g., limiting and focusing comments). Our goal with this workshop was not to standardize commentary or feedback-giving practices but to establish a common vocabulary and help participants critically reflect on their own practices.

At the beginning of the semester, all students involved in the research completed extensive surveys about their experiences with and attitudes toward writing, revision, and reflection. These surveys were identical across control and experimental groups, and our initial plan was to compare students' responses on the presurvey with their responses on the nearly identical end-of-term survey. Then, as students received feedback on their writing, students in control-group sections would complete "feedback-receipt surveys" that asked only whether they had received instructor feedback. Students in experimental-group sections would receive a more substantial "feedback-engagement survey" involving five writing prompts. These prompts asked them to (a) "identify and paraphrase the most helpful pieces of feedback [they] received," (b) use instructor feedback to reflect

on what they did well, (c) use instructor feedback to reflect on what they could improve on, (d) share what they learned through the feedback, and (e) summarize "what [they] think [they] need to work on as a writer at this point."

After COVID-19 interrupted our data gathering and left us with substantially fewer surveys, commented drafts, and grades than expected, we changed our approach. We decided to focus solely on the twelve students and their instructors (i.e., the professor and the teaching assistant) in the experimental group for whom we had the largest pool of data. After a failed yet productive attempt to code and quantify themes related to our research question in the available data, we decided to study respondents' work as dialogues. To do this, we first organized student data (i.e., survey responses, drafts, instructor comments, and grades) into individual files. In this way, we were able to see the "vertical" interactions among what individual students reported about writing, what they wrote in response to the assignment prompt, what instructors said about their writing, and what students said about the feedback they received. We then began a dialogic collaborative process through a series of four meetings, exploring each dialogue individually before coming together to analyze them in discussion (Paulus et al., 2008). Prior to the first meeting, each researcher analyzed three student data files, labeling student responses through a qualitative coding scheme (micro vs. macro, action vs. attitude, self vs. others, process vs. convention). During the first meeting, each researcher selected one student to showcase to the research team for group analysis. Through this collaborative discussion, we enhanced our individual analysis strategy to focus on the themes and heuristics we uncovered in the first set of student cases. The next three meeting cycles featured an iterative process of individual analysis and group discussion, each time further refining our themes and heuristics to match the student cases we observed (e.g., students remixing their instructor's wording). We tried many different characterizations in an effort to capture patterns in the dialogues. This process resembles the dialogic collaborative process detailed by Paulus et

al. (2008). In toggling between individual analyses and collaborative discussions of the feedback dialogues, we similarly found that "[a]lthough each of us contributed our individual ideas to the inquiries we conducted, we could not have predicted at the outset of each meeting where a spoken word would go, or how a written sentence would be interpreted, shaped, and woven into the collaborative meaning" (Paulus et al., 2008, p. 240). The emergent, iterative nature of our inquiry and meaning-making process ultimately led us to think about feedback—how we engage it and how we study it—anew.

During our analysis of the feedback dialogues, we noticed that students and instructors tended to use very different language to talk about writing. To analyze this emergent finding more systematically across interlocutor groups, we created separate corpora for student data (i.e., responses to presurveys and feedback-engagement surveys), instructor data (i.e., feedback comments), and our research instruments (i.e., presurvey and feedback-engagement survey). We also created subset corpora to capture more specifically how our feedback-engagement survey might influence students' feedback engagement. Using Voyant Tools, we found the word frequencies in each corpus and removed words with fewer than five occurrences. Using these frequency lists, we highlighted words that overlapped among corpora to find shared language, as well as those terms that were distinct for each list.

Limitations

Our study was defined by its pandemic-imposed limitations, and while our dialogic collaborative model led us to significant realizations about feedback, we should acknowledge other limitations, particularly in breadth, discipline, and our own influence as researcher-participants.

Our original research plan involved gathering data from several dozen students in three different courses. We planned to have several papers from each student with multiple process documents and instructor feedback documents for each paper. Due to our pandemic interruption,

we moved from a quantitative experimental design to a more in-depth, qualitative one and wound up studying around a dozen participants' surveys, drafts, and instructor feedback. Similarly, even though we had originally planned to collect data from three courses (i.e., writing, philosophy, and biology), our final document pool came only from a philosophy class.

As we talked about our qualitative findings and studied participants' writing, feedback, and revisions as kinds of dialogue, we recognized that we, as researchers, were also invisible interlocutors. By opening these class sections with an extensive survey about writing, revision, and reflection, we had created a new rhetorical context for the writing and revision to follow. By writing the prompts for the feedback-engagement survey, we joined the dialogue alongside the students and their instructors. Our presence was the most subdued, certainly, but we must recognize ourselves as members of the ongoing conversation.

Results

In this section, we present the findings that emerged from the dialogic collaborative process we employed. We see these results as an initial framework for theorizing feedback as boundary object. First, we share the results of our horizontal analysis: a language comparison involving the words used by students and instructors when discussing feedback. While this focus on language emerged from our efforts to identify trends in the feedback dialogues, we share these results first because they make visible the boundary running alongside student writing. More specifically, our corpus analyses identify the vocabulary, knowledge, and priorities each group brings to their engagement with feedback and reveal a corresponding lack of consensus around student writing on three levels: language, meaning, and motivation. Next, we present the results of our vertical analysis, which showed how instructors and students engaged with feedback as a boundary object. As introduced in previous sections, these dialogic infrastructures identify who or what drives the interaction, which in turn governs the interaction's structure, form, and direction. Even when the

content of instructor comments and student responses differs greatly, instructor–student interactions generally adhere to three dialogic infrastructures: student-driven, teacher-driven, and interaction-driven orientations.

Horizontal Analysis: Language Comparison

Students

Table 1 presents the most frequently used words of all terms that occurred at least five times in students' presurvey and feedback-engagement survey responses. There is considerable overlap in the top terms students used in presurvey responses and their feedback reflections (e.g., "paper(s)," "write," "writing," "ideas," and "better"). We see a consistent emphasis on the writing process and its product and general epistemological terms among survey responses, but the language shifts slightly when students consider a specific writing task. For example, writing-process words move from "sentences," "editing," and "grammar" in presurveys toward more global concerns like "outline," "structure," "organize," and "concise" in feedback-engagement reflections. Likewise, epistemological terms expanded from presurvey responses of "ideas" to feedback-engagement survey responses of "information" and "argument" as students grappled with instructor feedback. Our research instrument language was partially mirrored as our presurveys asked students to reflect on their *writing* and *revision* process, and our feedback-engagement survey prompted them to consider the *feedback* they received and how they might *improve* their writing (see Table 1).

Instructors

In the instructor corpus, there is evidence of an extensive and precise vocabulary that instructors use to discuss argumentation (e.g., "premise," "thesis," "claim," "objection") and common terms to guide students in their revisions (e.g., "good," "need," "don't," "make," "use"). We also see words germane to the assignment topic.

Students and Instructors

Shared language between students and instructors centered on assignment words ("paper[s]," "essay[s]"), general argumentation words ("argument," "thesis"), evaluative words ("need," "good"), and words suggesting next steps ("include," "want," "going"). Despite some shared language, students and instructors diverged substantially in how they discuss writing (see Table 1). Students talk about writing directly, often using composition language ("outline," "concise," "structure," "organization," "words"). We see that students picked up on their instructor's concern with "argument"; however, they discussed it using concepts like "idea(s)," "information," and "structure," whereas instructors, as noted previously, relied heavily on disciplinary epistemological language. Instructors' use of assignment topic words ("health," "steroids," "athletes," "fetus," "sports") is also distinct—students largely avoided content language.

While students' language reflects our instruments in part, it is also apparent that students rely on and prioritize their knowledge of the writing process, though we do see them move from more local concerns to more global concerns. As becomes clear in the next section, students often transformed the more specific disciplinary language they encountered in instructor feedback into concepts that they seem more comfortable with (e.g., "organization" and "structure" rather than "premise" and "objection"). Students seem to separate "ideas" from writing composition, reflecting, perhaps, the notion that ideas exist independently and the goal of writing is to effectively communicate them. Instructors, however, seem much less concerned with how ideas are communicated and instead prioritize critical thinking, logic, and topic coverage. We take this as evidence of a boundary between students' and teachers' knowledge and priorities for student writing, which converges in the object of feedback.

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Table 1

Student and Instructor Language Frequencies for Discussing Writing

Student presurvey	Student feedback engagement	Instructor	Shared*	Distinct: Students*	Distinct: Instructors*
writing (79)	paper (31)	argument (31)	paper(s)	writing	premise
paper (34)	writing (29)	good (23)	argument	feedback	think
papers (23)	argument (25)	premise (19)	need	better	claim
write (21)	need (21)	think	thesis	information	PES**
ideas (18)	feedback (20)	thesis (16)	good	ideas	objection
process (16)	better (19)	just (15)	essay(s)	outline	don't
revision (14)	information (18)	claim (14)	include	work	like
struggle	ideas (14)	PES** (13)	just	write	make
topic	outline (13)	need (12)	want	learned	use
draft (13)	work (12)	objection	going	point	assignment
make	thesis (11)	paper	really	concise	going
good (12)	write	don't (11)		helpful	health
usually	good (10)	like		important	conclusion
better (11)	learned	make		structure	empirical
improve	point	really		pieces	I'm
comments (10)	concise (8)	use (10)		plan	sure
professor	essay	assignment (9)		specific	you're
revise	essays	going		clear	appropriate
sentences	helpful	health		methods	doesn't
course (9)	important	conclusion (8)		organization	it's
like	include	empirical		reader	steroids
read	structure	I'm		time	support
typically	pieces (7)	sure		trying	actually
editing (8)	plan	you're		words	bad
help	specific	appropriate (7)		argue	citations
involves	clear (6)	doesn't		extra	expertise
just	just	include		going	fallacy
lot	methods	it's		helped	mean
bit (7)	organization	steroids		idea	premises
class	reader			materials	say
	time			organize	training
				papers	you're
				understand	ability
					athletes

Student presurvey	Student feedback engagement	Instructor	Shared*	Distinct: Students*	Distinct: Instructors*
enjoy	trying	support			defend
expect	want	actually (6)			equivocation
reading	words	bad			fetus
really	argue (5)	citations			know
thesis	extra	expertise			principled
thoughts	going	fallacy			sports
topics	helped	mean			things
way	idea	premises			values
able (6)	materials	say			
argument	organize	training			
believe	papers	you're			
essay	really	ability (5)			
given	understand	athletes			
grade		defend			
grammar		equivocation			
I'm		essay			
I've		fetus			
it's		know			
look		principled			
need		sports			
prompt		things			
research		values			
style		want			
think					
thought					
writer					
change (5)					
coming					
feedback					

*Between student feedback engagement and instructor comments.

**PES = performance-enhancing substances.

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Vertical Analysis: Dialogic Infrastructures

If our horizontal analysis revealed a boundary, our vertical analysis showed us what was happening at that boundary. By analyzing feedback on student writing vertically as assemblages that start with students' initial reflections on writing (i.e., presurvey) and include up to two rounds of instructor feedback, as well as students' responses to the feedback they received (i.e., feedback-engagement survey), we observed that feedback as boundary object can acquire different orientations according to how it is approached by both parties (i.e., instructor and student). We noted three forms for this infrastructure, which parallel three of the research streams we noted in feedback literature: teacher-driven, student-driven, and interactive orientations (see Table 2).

Teacher-Driven Orientation

A teacher-driven infrastructure can be seen in the data with more directive, general feedback and more reactive feedback responses. Students expressed an intention to act directly upon feedback, without negotiation. Within this infrastructure, the teacher might be seen as a traffic light that either flashes red (i.e., telling students to stop what they are doing and try a different approach) or green (i.e., telling students to maintain their current approach). The following examples highlight these two roles, respectively:

> **Red-light instructor comment:** "Here's the issue, you should really stick to ONE argument, and not several. Make one very good argument in the limited space you have, instead of several medicore [*sic*] (or possible bad/undeveloped ones)."

> **Red-light student reflection:** "I need to spend a fair amount of time going all in on this argument and coming up with tons of high quality, nuanced examples of my point."

Green-light instructor comment: "Thesis is overall fine, but remember if the reader doesn't know the argument . . ."

Green-light student reflection: "I did well on my thesis and overall structure."

In these examples, the infrastructure acquires its language, conventions, and norms more from the teacher, and students demonstrate permission-seeking behavior. This behavior is characteristic of students in traditional educational institutions in which "answer-getting dispositions" are readily facilitated by standardized testing and rigorously controlled learning environments (Wardle, 2012). Meanwhile, the role of the teacher as a gatekeeper is evident as well. Paired together, these dispositions simplify the complexity of writing into a process of following directions provided by the expert. Kleinsasser et al. (1994) identified gatekeeping as one role instructors in the disciplines may acquire when assigning more writing; they explained the classroom dynamic as follows: "Gate-keeping faculty are in control of classroom discourse. The student is regarded as material to be hammered or shaped into a model ready for the professionalized demands of the disciplines" (p. 125). We can see the instructor's control executed in these examples such that their assessment dictates a clear course of action for the student.

At the same time, we found that this orientation influences the language students use to reflect on feedback; indeed, students replicate the precise terminology used by their instructor (italics added for emphasis):

Instructor comment: "Overall though good outline, good *strategy*."

Student reflection: "I have a good *strategy* for how I am going to argue my thesis."

The student clearly read the instructor's feedback and expands on it by specifying the strategy that has been identified as good.

Ultimately, this orientation points to a potential pathway for students to build their compositional vocabulary and skills and gain access to the

academic community they are engaging with. At the same time, however, it threatens to undermine students' sense of agency and critical thinking about their writing. That is, teacher-led feedback serves as a gate, swinging open when students demonstrate writing and approaches to writing that are acceptable to the field and swinging closed otherwise.

Student-Driven Orientation

A student-driven infrastructure involves feedback that directly references students' ideas and tends to be more discipline-focused and specific in describing and assessing what students are trying to say or accomplish in the draft. With this structure, students filter feedback through what appears to be an existing schema for writing, or their understanding of effective writing and effective writing processes. This orientation can lead to a misinterpretation/misapplication of feedback when the feedback does not align with students' perspectives. We saw this unproductive outcome repeatedly when students were given feedback on their arguments or ideas. Some students reported confidence in their ideas even in the face of harsh critical feedback. For these students, ideas seem to exist independently and are either communicated or not communicated—not constructed through writing. Accordingly, students perceived feedback on their ideas as pointing to problems in translation (e.g., "organization" or "clarity") rather than problems with the logical approach, as the following examples highlight:

> **Instructor comment:** "Totally confused, start over. This is your thesis: 'In this paper I will argue that Marquis' argument is bad, in virtue of the fact that not every fetus has a valuable future.' This is your strategy/argument: 'Explain Marquis' commitment of a fallacy of equivocation by not defining what he means by a standard fetus.' These aren't the same thing. Basically your thesis and argument do not line up, so the paper is wrongheaded.

> **Student response:** "My ideas were good, but not well laid out. Need to reorganize the order and structure."

> **Instructor comment:** "This is a really good objection. Unfortunately, I think it is so good that you are not going to be able to defend your argument against it."

> **Student reflection:** "Advice on how to restructure my essay and grammar changes."

Of note with these examples is the critical nature of the feedback. Quite explicitly, the instructor informs the students to start over, that what they have is not working. But rather than return to an idea-generation stage, students apply the feedback to their writing only. They retain their ideas and focus instead on presenting them differently. With the student-driven orientation, feedback focuses on describing and evaluating what students are trying to say—the quality, logic, and feasibility of their arguments—without offering a strategy or guideline for revision. This puts students in the driver's seat, and in the face of critical feedback presented without a path forward, we see students respond in a surface-level way: They do not need to revise their ideas, just how they present them.

Interaction-Driven Orientation

An interaction-driven infrastructure starts with feedback involving both praise and specific strategies for improvement. Students, meanwhile, consider the feedback in light of not only the current project but their writing skills and writing vocabulary more generally. In the following example, we see a student rework a comment into their own understanding of writing that privileges a concise style (italics added for emphasis):

> **Instructor comment:** "Good intro, but don't *overdo* it. For instance, if you're not going to write about some of those authors, don't feel obligated to mention them. Mention who/what you'll discuss critically, leave everything else out."

> **Student response:** "I tend to *overdo* writing and add unnecessary information. I really want to work on being more concise in my writing and this was good feedback that made me more aware of how much I was adding to my paper that wasn't important."

The student integrates the instructor's language and their own writing language to describe a struggle with their writing and a larger writing goal that transcends this particular project.

In the next example, we see the productive remixing of language applied to the related concepts of organization, structure, and flow:

> **Instructor comment:** "Second, there's some slight ordering issues here. For instance, why start with the claim that the third premise is questionable, when you seem to be arguing that all the premises which contain fetus are? Moreover, if you believe they're all questionable it might help to move Step 3 part 2 to part 1? And Step 3 part 3 to part 2."

> **Student response:** "Specifically on my outline, I got feedback on how to rearrange some of my steps to make my essay flow better. . . . It was also helpful that I was told structurally how to rearrange my outline, so when I go to write my paper I have a good idea of how my paper should be properly structured."

The student takes the comment and considers it more broadly in reflection. The words used by the instructor and student to discuss a revision strategy are closely related, and the student demonstrates an understanding of the instructor's specific feedback in light of a larger writing concern: the paper's organization.

With all instances of interaction-driven engagement, we observed the application of specific feedback to more global writing concerns (e.g., style, structure, or argumentation). In a sense, we can see interactions driving toward a cocreated writing heuristic, a guideline that transcends a specific edit on a specific paper.

Table 2
Summary of Dialogic Infrastructures

Orientation	Feedback characteristics	Student language	Student action	Implications
Teacher-driven	Directive, general, reactive	Student adopts instructor's language to talk about writing	Instructor feedback is interpreted as a *red light* or a *green light* for decisions made in a draft	Reinforces idea of writing success as a matter of following instructors' directions; students' agency as writers erodes
Student-driven	Not directive, specific, focused on disciplinary content and ideas	Student expresses thoughts about writing in a manner distinct from that of the instructor	Instructor feedback is misinterpreted/misapplied: specifically, ideas are considered distinct from the communication of ideas	Reinforces distinction between ideas and the written presentation of ideas; students rely on their preexisting understanding of writing conventions and vocabulary

Orientation	Feedback characteristics	Student language	Student action	Implications
Interaction-driven	Contains praise, progress-oriented, strategy-oriented	Instructor and student languages are remixed	Feedback is applied to larger writing goals and considerations	Reinforces writing as a collaborative, context-specific activity and developmental process; students continually develop as writers in diverse contexts

Discussion

We cannot say that asking students to engage directly with feedback on their writing supports student learning; instead, we can say that explicit engagement with feedback enabled us as researchers to see students' sense-making at the boundary of student writing. From this vantage point, we approached feedback as a boundary object that facilitates communication, action, and understanding around student writing.

When we think about what feedback as boundary object means for how writing instructors might effectively respond to student writing, we propose the following:

1. Create a shared language for talking about writing. According to Carlile (2002), to be effective, a boundary object first "*establishes a shared syntax or language for individuals to represent their knowledge*" (p. 451, italics in original). As our results showed, students and instructors typically use very different vocabularies to talk about writing, and the difference might turn feedback into a roadblock to learning or could even lead to misconceptions or misunderstandings

about writing. This finding recasts our understanding of why marginal instructor marks and codes fail to support student learning, as well as why peers have been found to be effective reviewers for each other (e.g., Topping, 1998), for instance. Especially without an opportunity to ask questions or respond to feedback directly, students may gloss over commentary composed in what appears to be a different language. Instructors could scaffold feedback with a collaborative glossary of writing-related terms. Care should be exercised to use these shared terms, define more specialized words that arise, and, as a class, negotiate meaning together throughout the semester, moving toward consensus.

2. Establish a dialogue around feedback. By standardizing a dialogic process around feedback, instructors can make explicit the student–teacher exchanges (i.e., of language and actions) involving student writing. This interaction paves the way for its participants to claim agency in the process, thereby meeting Carlile's (2002) second and third criteria for effective boundary objects: enabling participants to raise concerns and to learn together. For instructors concerned about whether students will read and apply their feedback, establishing a dialogue around feedback offers the opportunity for instructors to confirm that their students have read and engaged with their comments.
3. Increase transparency about feedback. Early in the semester, instructors might share with students their feedback philosophy and practices and the role they see feedback playing in students' writing processes. In other words, instructors need to talk about feedback to make it an explicit practice and uncover hidden assumptions or expectations. At the same time, students can be primed to engage feedback as a boundary object with opportunities to share their goals, discuss their processes, and reflect on the language they use to talk about writing.

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Conclusion

Ultimately, our investigation calls for a rethinking of feedback and its role in our classes. The language comparison supports our observation of the social worlds that come together at the boundary of student writing, while the dialogic infrastructures show how students and teachers, as well as researchers (as the infrastructure architects), activate their world-specific interests and language in the boundary-object space. In turn, we might focus on feedback as "a nexus of perspectives" (Wenger, 1998, p. 108), its meaning deriving from student writing meeting the teacher's response meeting the student's interpretation of that response, and so on. Thus, the utility of feedback, as C. P. Lee (2007) and Lutters and Ackerman (2007) attest, requires information beyond the comments themselves. This observation aligns with the discussion emerging from the interaction-driven stream of feedback research (i.e., Hattie & Timperley, 2007; Perpignan, 2003). We acknowledge that feedback research requires a different lens to determine feedback's role in students' writing skills development.

Future studies that maintain the boundary-object framework for feedback might look more closely at various learning processes (e.g., Akkerman & Bakker, 2011) to study the relationship between those learning processes and the language and dialogic infrastructure of feedback in a variety of contexts. Regular writing classroom visits to observe and shadow instructors and their students paired with semistructured interviews and text analyses might enable researchers to better understand feedback as boundary object and the various strategies instructors and students use to engage it. Such work might utilize thick descriptions of feedback dialogues to characterize participation in these exchanges, as well as the exchanges themselves. These approaches might allow researchers to trace engagement practices and map their trajectories over a semester. These future studies would afford a closer look at the power dynamics in engaging feedback as a boundary object and provide a way to explore and evaluate the suggestions we outline in our discussion.

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While this theoretical framework has opened up exciting pathways for further research, it is in the classroom that the implications of our initial theorizing can have a more immediate impact, defamiliarizing feedback so that instructors and students see it as a collaborative space. They might tack back and forth in this space as they talk about writing, moving toward new understandings, a shared yet provisional consensus, draft after draft, project after project.

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