CHAPTER 8

CULTIVATING CONSTRUCTIVE METACOGNITION: A NEW TAXONOMY FOR WRITING STUDIES

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Writing studies scholars have highlighted the concept of metacognition in various settings, including the *Framework for Success in Postsecondary Writing* (2011) and recent research on the transfer of writing knowledge into new contexts (Nowacek, 2011; Reiff & Bawarshi, 2011; Rounsaville, Goldberg & Bawarshi, 2008; Taczak, 2011; Wardle, 2009). Understood broadly as thinking about thinking, metacognition has been defined more specifically as "the ability to monitor one's current level of understanding and decide when it is not adequate" (National Research Council, 2000, p. 47) or "the ability to reflect on one's own thinking as well as on the individual and cultural processes used to structure knowledge" (Council of Writing Program Administrators, National Council of Teachers of English & National Writing Project, 2011, p. 5). Further, metacognition and related terms have been used to describe practices linked to writing transfer. For instance, writing studies scholars have considered students' meta-monitoring of composing processes, rhetorical situations, and genre knowledge (Negretti, 2012; Nowacek, 2011; Reiff & Bawarshi, 2011). Despite conceptual and methodological differences, much writing studies work on transfer has suggested ties between metacognitive capacities and the ability to transfer writing skills and concepts across contexts (Nowacek, 2011; Reiff & Bawarshi, 2011; Wardle, 2009). Yet, writing studies does not have a model that defines the specific components and subcomponents of metacognition or their relationships. Nor does it have strategies for teaching these (sub)components, either individually or to promote metacognitive development that supports the transfer of writing-related knowledge across courses and contexts.

The importance of metacognition in successful learning has been described widely across disciplines including education (Dignath & Buttner, 2008), reading comprehension (Cross & Paris, 1988; Haller, Child & Walberg, 1988;

DOI: https://doi.org/10.37514/PER-B.2016.0797.2.08

McKeown & Beck, 2009; Thiede, Griffin, Wiley & Redford, 2009; Williams & Atkins, 2009), science (White, Frederiksen & Collins, 2009), and mathematics (Jacobse & Harskamp, 2012; Mevarech & Kramarski, 2003; Lobato, 2003, 2012). Defining and identifying metacognitive elements, however, continues to be a difficult task (Georghiades, 2004; Scott & Levy, 2013). As Scott and Levy observed, "Metacognition is a fuzzy concept but widely used by the research community," and prior to their study, "it [was] still unclear if there is an umbrella concept with one major factor that can be labeled metacognition or whether metacognition has clear and distinct factors upon which researchers can base their research" (2013, p. 121). Writing studies scholars like Nowacek (2011), Reiff and Bawarshi (2011), and Wardle (2009) gestured toward the importance of metacognition for transfer but have not yet considered its operation, development, complexity, and components or addressed the concept's "fuzziness." As we show below, this fuzziness has posed both conceptual and methodological problems for understanding where and how students are using metacognitive skills in writing tasks. Further, fuzziness about metacognitive components poses a challenge for teachers, who need a clear explanation of what the components are, how they relate to one another, and how they support writing transfer. Perhaps most importantly, instructors need information on how to teach metacognitive components in ways that promote transfer.

We address this problem by constructing a taxonomy that identifies the metacognitive moves that students use in college-level writing. We grounded the taxonomy in a qualitative, theoretically informed analysis of students' written reflections and interview data about writing. Using the taxonomy, we show how writing instructors can teach the key metacognitive components cumulatively, in ways that help students develop what we call *constructive metacognition,* a metacognitive move that demonstrates a critically reflective stance likely to support transfer of writing knowledge across contexts. While this type of metacognition is only one of several factors that appear to support students in transferring writing knowledge, we show that students who engage in constructive metacognition reflected on their texts, strategies, and sense of writerly identity across a series of writing tasks and contexts by using writing and rhetorical studies concepts. As we discuss, these reflections seem linked to the transfer of writing knowledge across contexts.

Our work extends two principles articulated in the *Elon Statement on Writing Transfer* (2015; Appendix A): (1) that students' meta-awareness often plays a key role in transfer and (2) that learners may engage in both routinized and transformative types of transfer when drawing on prior knowledge. The curricular and classroom practices we recommend below support two of the enabling practices advocated by the *Elon Statement*, as well as one of the statement's working principles. The first enabling practice involves asking students to engage in activities

that help them develop metacognitive awareness. The second practice entails explicitly modeling transfer-focused thinking, in this case, forms of metacognitive thinking. The working principle from the *Elon Statement* posits that students who receive explicit rhetorical instruction have better chances of transforming rhetorical awareness into stronger rhetorical performance.

In what follows, we discuss writing studies scholarship on the role of metacognition in writing development and transfer, overview metacognition in current psychology research, and show how we drew on that research and our qualitative analysis to construct a taxonomy of metacognitive components specific to writing. Using the taxonomy, we demonstrate how writing instructors can teach individual metacognitive (sub)components in order to help students integrate the (sub)components in ways leading to constructive metacognition. While further research is needed to ascertain the role of constructive metacognition in students' writing development, both our initial findings and established theories of writing development suggest that it may do so. However, as we discuss below, it is only one factor in writing transfer, and we recommend ways to link it to other factors to optimize students' potential for transferring writing knowledge across contexts.

PROMOTING WRITING TRANSFER THROUGH METACOGNITION

Recent writing studies research has begun to consider how metacognition can promote writing knowledge transfer. Like earlier work by Flower and Hayes (1981), current studies have examined students' thinking in relation to composing (Beaufort, 2007; Reiff & Bawarshi, 2011). While Flower and Hayes developed a cognitive model, more recent studies have extended the investigation of writers' thinking to metacognition. Cognition involves thinking to perform a task, while metacognition entails reflection on that thinking, its efficacy, and/or its outcomes. Clearly, cognition and metacognition are closely linked, and Flower and Hayes' work addressed an important component of metacognition—monitoring—which we define below. Similarly, Beaufort's (2007, 2012) work has suggested the increasing emphasis on metacognition by stressing the importance of metacognition's role in situated writing performances. This emphasis on metacognition and closely related terms has expanded in the last several years.

For instance, some recent research has linked important writing studies concepts like genre knowledge to meta-awareness, which promotes critical, flexible engagement with new writing tasks. Researchers have investigated students' meta-awareness of genre as they move between writing tasks and contexts. Rounsaville, Goldberg, and Bawarshi, for example, suggested that metacognitive

knowledge can enable students to "reorient their relationship to what they already know," and they use student survey and interview data to show that mindfully connecting the demands of new writing situations to prior genre knowledge may help students to mobilize their writing repertoires across contexts (2008, p. 108). However, these scholars focused on identifying the prior genre knowledge that students bring to first-year writing and did not explore metacognition as a construct, beyond noting its role in transfer.

Other studies have suggested the importance of metacognition in writing development and transfer, particularly in relation to reflection, but have not defined its nature, components, or role. Reiff and Bawarshi presumed that reflection prompted metacognitive development that facilitates transfer (2011, p. 315). Earlier, Nelms and Dively made similar presumptions concerning metacognition and reflection, arguing that "reflection represents an important mechanism for achieving metacognitive awareness of the potential for transferring learning across contexts" (2007, p. 216). Similarly, both Wardle (2009) and Bergmann and Zepernick (2007) argued that while students did indeed learn writing strategies deemed valuable by compositionists (such as a flexible writing process that included drafting and revision techniques), students claimed that the *kinds* of writing done in the first-year writing (FYW) courses that required these strategies were applicable only in other English courses (Bergmann & Zepernick, 2007; also see Driscoll, 2011) or that the writing tasks they encountered in future courses did not demand the use of these strategies (Wardle, 2007). While Bergmann and Zepernick did not explicitly discuss students' decisions to ignore writing skills and strategies as metacognitive choices, these decisions suggest that students made such choices, whether consciously or not. Wardle stressed the need for students to develop metacognitive skills, arguing that "*meta-awareness about writing, language, and rhetorical strategies* in FY[W] may be the most important ability our courses can cultivate" (2007, p. 82).

While several of these projects drew on Perkins and Salomon's (1989, 1998) influential work on transfer and suggested that transfer relies on students' ability to "reflect on one's choices and decisions" (Nelms & Dively, p. 218), none provided an operationalized definition of metacognition, which researchers need in order to identify and analyze metacognitive functions as students learn to write and which instructors need in order to help students cultivate specific metacognitive capacities to support writing and writing development. Writing studies scholars have not yet considered the nature and effects of the different kinds of metacognitive moves students make while writing, whether different reflective activities may prompt different metacognitive moves, or the role of such different moves in writers' development. As Nowacek argued, "The nature of these metacognitive abilities needs to be further qualified and described. To put our

faith in unspecified metacognitive abilities is tantamount to pointing to a black box in which a general cognitive ability magically operates" (2011, p. 17). In short, the field has yet to conceptualize how metacognition operates in writing.

This lack of specificity in prior research has posed more than just conceptual limitations to understanding writers' development. Without such specificity, instructors have no way to identify students' work with particular metacognitive (sub)components, to understand how these (sub)components interact to support writing development, or to teach the (sub)components, either individually or cumulatively. For instance, while Negretti's (2012) work has shown the importance of basic writers' self-regulation in their writing development, her study did not address the relation between regulation/control and other metacognitive (sub)components. As a result, the study could not provide a framework for considering how these (sub)components interact in writing and for designing approaches to teaching the (sub)components.

Thus, while recent research has stressed the role of metacognition in writing transfer, only a few studies have examined metacognitive moves in student writing; none, to our knowledge, have identified and defined the *metacognitive (sub)components* and how they operate in writing.[1] Yet investigating how writers use such (sub)components is crucial to promoting transfer for four key reasons: (1) Psychology scholarship on metacognition shows that metacognitive (sub) components play an important role in governing task completion and learning; (2) Our research suggests that when metacognitive moves occur during writing, they often do so in forms specifically shaped by writing knowledge; (3) We need to learn how the various (sub)components of metacognition relate to one another in supporting writing development and transfer; and (4) Understanding these (sub)components makes it possible to teach specific metacognitive moves—rather than generalized awareness of cognition—and to help students integrate such moves into the writing process, as well as into their discussions of their texts, which prior research suggests is important to their development of expertise (Anson, 2000). Our study pursues such understanding, as well as insight into how this understanding might inform writing instruction.

Therefore, we ask these questions:

- When and how do metacognitive moves occur when students reflect on and talk about writing?
- Do such metacognitive moves rely on conceptual and/or procedural knowledge about writing?
- If so, what kinds of conceptual and/or procedural knowledge are needed, and how do these forms of knowledge support metacognitive moves?

- How might examining these metacognitive moves provide a more nuanced understanding of metacognitive (sub)components, as they function in student writing?
- Do these moves show interactions between metacognitive (sub) components, both in specific writing tasks and in writers' development across tasks? If so, how?
- Which moves, or combinations of moves, seem likely to lead to more successful transfer?

Answering these questions may open Nowacek's (2011) black box to reveal more precisely how metacognition supports both the development and transfer of writing knowledge. We address them below by presenting our findings from a mixed-methods, longitudinal study of student writing at four universities with different missions, student demographics, and locations.

METHODOLOGY

Dataset

The data from this project was sampled from a larger multi-institutional dataset collected over a two-year period through the Writing Transfer Project. The larger dataset includes work produced by 123 students at four universities as they took five different writing courses (first-year writing at George Washington University, Oakland University, and Seton Hall University; intermediate writing at Wayne State University; and upper-division writing at Oakland University) and work produced by a subset of students writing in subsequent courses. We define students' "initial course" as the writing course students first took in the study (which may not be their first writing course at college). As part of their initial courses, students were asked to write a series of reflections designed to facilitate metacognitive awareness, rhetorical knowledge, and transfer of learning. The dataset includes multiple reflections from each student, using a similar prompt at each institution (N = 398); student papers written before, during, and after their writing courses (N = 274); and follow-up interviews with a subset of students (N = 30) the year after the initial writing courses. The interviews lasted 45–80 minutes, and students were asked a number of questions on writing, metacognitive awareness, genre awareness, and transfer of learning. At Seton Hall, students completed a second interview that included a think-aloud writing protocol in which students described their processes for drafting a paper for a course taken after their initial writing courses. At the remaining sites, students discussed a paper they wrote in a course after their initial writing courses.

As part of the larger study, 274 student papers were rated by a group of trained graduate student raters from multiple disciplines. Raters used a rubric designed by the authors to evaluate the effectiveness of texts in meeting genre conventions, including the use of sources, contextualization, and responsiveness to disciplinary audience, purpose, and style.

Further, the research team identified potentially important categories related to transfer and developed these categories into 98 codes in six categories, including two important to this study: transfer-focused thinking and metacognition. Initial coding generated 14,156 code applications for 381 reflective pieces of writing and 38 interviews.

Sampling

Because our initial coding in the larger dataset covered a wide range of categories, it suggested the importance of metacognition in transfer but did not provide the detailed picture needed to specify metacognition's role in writing development and transfer. The patterns revealed by our initial coding suggested that we needed to develop a more detailed set of codes for examining students' representations of their metacognitive moves. We focused on two types of data in our set that we believed were most likely to include such representations. The first entailed students' responses to our final reflective prompt; students wrote this reflection after completing their final papers or portfolios. The second entailed students' follow-up interviews, which described various writing experiences a year after students' initial writing courses. These two document types represent both the kinds of data writing transfer researchers often collect (student interviews and analysis of student writing) and the kinds of data that writing teachers often encounter (reflective writing).

To begin a limited exploration of how metacognition and written performance relate, we used students' writing rubric scores to sample from our larger dataset. We found that some students' scores improved from the final paper in the initial course to the paper in the subsequent course, while others' scores declined. Therefore, we randomly selected one student from each university whose scores had increased and one student whose scores had declined. This yielded a subset of eight student interviews and eight final reflections; all three types of courses are included in the sample.

Collaborative Glossary Development

To develop codes, we drew on Smagorinsky, who suggested that coding is not a "static representation of reality" but rather a dynamic, collaborative process

that yields "continual refinement of categories" (2008, p. 393). We believe his approach is well suited to this project because the work is in-depth and exploratory. Using it, the first three authors of this manuscript worked collaboratively throughout the coding process to develop, refine, and redefine categories. To provide a framework for our coding glossary, we discussed our readings of the metacognition literature and several example reflections and interviews not included in our small sample from the larger dataset We collaboratively coded all reflections and the first five interviews, reading each paragraph or segment individually, then discussing and coding it. Disagreements often led to code revisions, prompting us to refine or add to the codes; through this process, we developed a new category in the taxonomy—constructive metacognition—as well as markers for deep and shallow metacognition. A table of the codes we used appears in the section presenting our taxonomy.

The coding approach we used yields 100% inter-rater reliability because coders do not move forward until there is complete agreement. After coding eight reflections and five interviews, we reached saturation, based on Creswell's criteria, "the point when you have identified the major themes and no new information can add to your list of themes, or to the detail for existing themes" (2002, p. 244). We each individually read and coded one of the last three interviews, discussing any questions with the other two group members who were present.

In addition to the collaborative coding, we examined the relationship of writing scores to metacognitive codes for the eight papers. For all eight students, we had two scores: a score from a paper written at the end of their initial writing course and a score from a paper we collected approximately one year later. Half of these students had scores that declined and half had scores that improved. We examined the patterns in metacognitive awareness (through number of codes) to identify possible relationships between metacognition and student writing performance over time. Further, we examined numbers of code co-occurrences, when two or more codes appeared in the same text segment to identify relationships between codes within the taxonomy.

Study Limitations

We set out to develop a taxonomy of students' depictions of the metacognitive moves they make while writing. We examined qualitatively how students described these moves but, due to the demands of qualitative analysis, we could not code a sample large enough to allow us to draw generalizable conclusions. Nonetheless, we examined our relatively small coded sample quantitatively to investigate code co-occurrences and the relationships between our codes and

students' writing performance over time. Because our purpose in this study was to develop the taxonomy to support instruction and further research, we hope that later, larger-scale studies using it will uncover such relationships.

Further, we examined mostly retrospective data (interviews and reflections). These data provided insight into metacognitive knowledge (person, task, strategy) and some forms of regulation (evaluation) but not into all of the metacognitive (sub)components students may use while writing. Nowacek (2013) noted that retrospective data limits access to students' use of metacognitive (sub)components during the writing process, as students' memories are likely imperfect.

Retrospective data also raises questions about the reliability of self-reported data, particularly in research on metacognition. Study participants may choose not to reveal all relevant information and may not be consciously aware of all of relevant cognitive and metacognitive moves. While there has been debate over the existence of nonconscious metacognitive thinking (Efklides, 2008; Hacker, 1998), because it has thus far been impossible to track such thinking, most researchers have focused on conscious metacognitive moves (Georghiades, 2004; Harris, Alexander & Graham, 2008). Further, students may report what they predict teachers or researchers wish to hear. Despite the limits of self-report data, H. Rubin and I. Rubin argued that qualitative interviews are best for learning about issues that are not simple or brief, but rather require in-depth explanation (2005, pp. 2–3). Because we looked not for general claims about the utility of what students learned but instead for evidence of students' work with specific metacognitive (sub)components, such as analysis of a student's particular strengths and challenges in relation to a specific writing task, such in-depth modes of data collection were especially useful for our study.

Thus despite its limitations, we believe such data is still valuable. First, it reveals which metacognitive moves students see as relevant to the writing process. Second, Lobato (2012) argued that to understand transfer and what facilitates it, we need self-reported data to examine the roles of students' dispositional traits and perceptions of their problem-solving efforts. Third, by prompting students to talk through their texts and writing processes, producing such data may make some of their nonconscious or unarticulated metacognitive moves more visible or more conscious. Making these moves visible provides us with a basis to help teachers recognize the moves and to guide students in extending them in ways that build students' metacognitive capacities. As we discuss below, by developing prompts that ask students to evidence specific metacognitive moves, reflective assignments can help shift students away from teacher-pleasing responses into practicing activities that build their metacognitive capacities.

TAXONOMY

Overview, Sources, and Rationale

To develop our codes, we turned to Scott and Levy's (2013) study of the components of metacognition. We did so because Scott and Levy worked with the five components of metacognition most accepted by psychology researchers (knowledge of cognition, planning, monitoring, regulation/control, and evaluation) and because they incorporated definitions of key subcomponents.[2] Their statistical analyses of students' responses to survey instruments showed that these components and subcomponents work closely together and can be grouped under two overarching factors, knowledge of cognition and regulation of cognition.[3] Knowledge is the first of the five components and entails knowledge about one's own thinking and about thinking more broadly. However, knowledge also includes three subcomponents: person, task, and strategy. Person involves understanding one's own thought processes and the fact that others have distinct thought processes; task consists of understanding the affordances and constraints posed by a project and its circumstances; and strategy includes knowledge of the range of approaches one might effectively use to complete a project. Planning, the second of the five components, entails identifying a problem, analyzing it, and choosing a strategy to address it. Monitoring, the third, involves evaluating one's cognition and efforts toward a project. The fourth component, regulation/control, includes the choices one makes as the result of monitoring. According to Scott and Levy, such choices may be conscious or not. The final component, evaluation, entails assessing the quality of a completed project.

We made one substantial revision to Scott and Levy's (2013) terms by drawing on Harris, Graham, and Sandmel's (2009) definition of person, which is more specific to writing and so more useful for us. Harris et al. defined person as "the knowledge the writer has about themselves [sic] as a writer, including such things as what forms of writing have been engaged in successfully or unsuccessfully in the past, what components or elements of writing they're comfortable with, and which they have not yet mastered (such as using dialogue in creative writing) and what environmental characteristics are preferable" (2009, p. 134). Using this explanation, we included understanding of genres, conventions, and rhetorical and writing process strategies in our definition of person.

Further, based on our coding, we developed a metacognitive category not mentioned in Scott and Levy's (2013) or Harris et al.'s (2009) discussions, one we have named constructive metacognition, following Yancey's (1998) work on reflection. Yancey explained that by reflecting on strategies they found helpful

in one context, writers develop principles they can use to construct prototypical models to guide their work in subsequent contexts, thus shaping their identities as writers. For Yancey, such constructive reflection results from cumulative reflections that allow the writer to apply knowledge gained in a set of prior experiences to subsequent experiences. As she noted, constructive reflection entails reflective transfer. However, she added, it also takes one "from being able to generalize across rhetorical situations to *seeing oneself so generalize,* seeing oneself interpret differently from one to the next and understanding that these generalizations . . . exert their own cumulative effects" (Yancey, 1998, p. 51). Because asking writers to reflect explicitly on their texts promotes such seeing, she argued, it contributes to the conscious construction of a writerly identity across composing contexts. Swartz and Perkins (1990) argued that such work helps writers move from the strategic level of metacognitive thinking to the reflective level, where they use strategies not just out of habit but by consciously considering a possible strategy's appropriateness and effectiveness for a given task. Such consideration may occur before, during, and after task completion, as "through reflection, [students] can probe and assess, revise and test, their own thinking processes" (Swartz & Perkins, 1990, p. 53). Constructive metacognition entails reflection across writing tasks and contexts, using writing and rhetorical concepts to explain choices and evaluations and to construct a writerly identity. By illustrating each subcomponent and how these subcomponents work cumulatively to promote constructive metacognition, our taxonomy lays the foundation for teaching metacognition. More specifically, we explain below how instructors can guide students in practicing individual subcomponents in a way that cultivates constructive metacognition.

Our set of coding categories, based on our augmented version of Scott and Levy's (2013) set of metacognitive terms, enables us to specify more precisely the relations among the components and subcomponents of metacognitive knowledge. The subcomponents and their definitions follow in Table 8.1.

As we illustrate below through examples of each (sub)component, the (sub)components' specificity allows us to examine in more detail the kinds of metacognitive moves that appeared in students' written and oral reflections on their texts and writing processes. This groundwork enables us to consider questions of (a) writers' metacognitive development across tasks and contexts and (b) the socially shaped nature of metacognition. Understanding this social character leads us to emphasize the importance of teaching the metacognitive (sub)components in courses that promote other transfer factors, such as student motivation, engagement, and understanding of the connections between the material students are learning and, broadly speaking, how students will use this material in subsequent contexts.

Table 8.1. Definitions of metacognitive subcomponents identified in this study

Metacognitive Subcomponent	Definition
Person (Knowledge of Cognition)	Knowledge of oneself as a writer, including one's (un)successful use of genres, conventions, and rhetorical and writing process strategies
Task (Knowledge of Cognition)	Understanding of affordances and constraints posed by a project and its circumstances
Strategy (Knowledge of Cognition)	Knowledge of the range of approaches one might effectively use to complete a project
Planning (Regulation of Cognition)	Identifying a problem, analyzing it, and choosing a strategy to address it
Monitoring (Regulation of Cognition)	Evaluating one's cognition and efforts toward a project
Control (Regulation of Cognition)	The choices one makes as the result of monitoring
Evaluation (Regulation of Cognition)	Assessing the quality of a completed project
Constructive Metacognition	Reflection across writing tasks and contexts, using writing and rhetorical concepts to explain choices and evaluations and to construct a writerly identity

Key Coding Distinctions

To illustrate the metacognitive moves students described and how these moves operate in writing, we offer examples of each (sub)component we coded. Several of the types of thinking represented by these (sub)components can take either cognitive or metacognitive form, while others are inherently metacognitive. As explained above, cognition entails thinking to complete a task, while metacognition involves reflection on that thinking and its efficacy or outcomes. Task, planning, control, and strategy can all occur either as cognitive moves or as metacognitive moves, depending on whether they are used consciously or habitually and uncritically.[4] In each case, a writer may describe thinking processes, such as analyzing the affordances and constraints of a writing task, without conscious awareness that she or he is engaging in such analysis. We categorize such instances as cognition rather than as metacognition, and for each type of thinking that can occur cognitively or metacognitively, we provide examples to clarify the differences. In contrast, person, monitoring, evaluation, and constructive metacognition are all inherently metacognitive. Although Scott and Levy (2013) suggested that metacognitive thinking may happen nonconsciously, we follow Georghiades' (2004) and Swartz and Perkins' (1990) emphasis on conscious metacognition, though we do include moments when students consciously reflect later on the use of thinking processes they may originally have employed nonconsciously.

The charts below present examples of each metacognitive component or subcomponent to illustrate its role in students' rhetorical choices and writing processes, both in completing individual writing tasks and their construction (or not) of a writerly identity across tasks. In coding, we found that some instances of metacognition included significant depth and detail, so we coded these as "deep." In contrast, other instances lacked depth and detail, so we coded them as "shallow." Most instances included a middling level of detail and therefore were coded as "middling." We include samples of all three types (deep, shallow, and middling) in the charts, and we discuss the significance of deep metacognition below. To ensure clarity, we present and gloss examples of one (sub)component at a time. We note code co-occurrences in the body of the taxonomy to alert researchers and teachers to the likelihood of co-occurrences as they work with particular (sub)components.

Component and Subcomponent Examples

Chart 8.1. "Person" metacognitive subcomponent and examples with codes

(Meta)cognitive Subcomponent

Person: knowledge of oneself as a writer, including one's (un)successful use of genres, conventions, and rhetorical and writing process strategies

Cognitive Example

N/A

Metacognitive Examples

(Interview) New skills [I needed to learn]? Well, I'm definitely gonna have to adjust my view of the comments I received because [the instructor] made some comments that I hadn't considered, I guess. So I'll definitely have to . . . And I understand that. I understand that he's not trying to get me or anything . . . I'm just stubborn, I suppose. . . . Yeah, I'll have to be more open to suggestions. **(Middling)**

(Interview) Oh, I'm really tired. All right, I'm gonna make a flow chart. I can't think in my head. **(Middling)**

(Interview) I like the way I form sentences . . . I think they are more complex. I don't just say, "When Gregor did this . . ." I was like, "Thinking this, Gregor, in a debilitated state . . ." That's something I'm really proud about—having cultivated my sentence structure and my use of vocabulary. I feel like my vocabulary is really colorful. . . . I feel like that's something essential to writing. . . . Especially if you have a term, I suppose. You see that term over and over again, but you need a little variety to surround it, to make it interesting, to hook your reader. **(Deep)**

As these examples show, knowing oneself as a writer includes understanding one's dispositions (e.g., toward stubbornness or openness) and physiological state and its effects (e.g., tiredness), as well as one's capacities (e.g., to use a broad vocabulary or form complex sentences). The final example shows deep metacognitive understanding of self as a writer because the student articulates the importance of the skill (to hook one's reader by using a key term in varying ways). Further, knowledge of oneself as a writer often relates closely to knowledge of strategy use, as suggested by the second and third examples. We discuss this connection in more depth below.

Chart 8.2. "Task" metacognitive subcomponent and examples with codes

(Meta)cognitive Subcomponent

Task: understanding of affordances and constraints posed by a project and its circumstances

Cognitive Example

(Interview) Well, I guess throughout the whole paper, I'm personifying these creatures. . . . So I say, "Though these bodies do not appear human, they are inhabited by psyches that exhibit human-like behaviors and drives." . . . I'm just tying it back to my original point . . . Which makes it definitely an essay. **(Middling)**

Metacognitive Example

(Interview) *Student* [on why a final project was assigned]: I think it was a way for us to pick a certain type of writing—a certain type of article that we thought was easy to write because . . . the six different assignments were kind of all over the place. And this allowed us to kind of write where we felt most comfortable and felt we could succeed while showing [the instructor] . . . what he wanted to see. **(Shallow)**

Cognitive Example

(Interview) So we were given . . . a narrow list of topics about five or six, um, I don't think there was a minimum or maximum page requirement just because the instructor expected us . . . it was going to be a big paper where we're going to be doing pretty intensive analysis of the topic. **(Middling)**

Metacognitive Example

(Interview) *Student* [explaining what was difficult in writing a specific paper]: Taking myself out of it. . . . It's sometimes easier to think that if you have an inside view to something, it'll be easier to write about, [and] in some aspects it did help because I did have people I could talk to . . . But at the same time, if my audience was the [university name] population, they're looking at it differently than I will. And that was hard for me to kind of grasp. **(Middling)**

In the examples of cognition about a writing task, students describe the constraints of the task but not how those constraints shaped their thinking about the task or strategies for approaching it. In contrast, while the shallow example of metacognition provides little depth, it shows the writer's analysis of the task as encouraging students to choose genres or conventions used successfully in the past. The fully metacognitive example in the second excerpt reveals the writer's examination of the task's affordances and constraints (access to interviewees able to provide important information and an audience unfamiliar with the details of the topic). It also links these task aspects to the student's understanding of a writerly self. Students often made such links, as Scott and Levy's (2013) emphasis on the connections between metacognitive components and subcomponents implies they should.

Chart 8.3. "Strategy" metacognitive subcomponent and examples with codes

(Meta)cognitive Subcomponent

Strategy: knowledge of the range of approaches one might effectively use to complete a project

Cognitive Example

(Interview) *Interviewer*: What skills did you bring to this paper when writing? So what did you already know how to do?

Student: Start it like . . . that's what I knew . . . my whole writing process like I know it works for me so, like, I applied it to this and it worked. **(Shallow)**

Metacognitive Example

(Interview) *Student* [explaining what helped her or him succeed in the course]: I think [when] I was just not getting it, I talked to [the instructor] and said, "I am not a Journalism major. I do not know what I'm doing. I need help." And I think that was when I started to realize that asking him for help and asking him to revise my papers and [show] me successful articles and how they were different from what I was writing really helped . . . I worked to change how I was writing, but he definitely helped. **(Middling)**

Cognitive Example

(Interview) *Student* [explaining where she or he learned to use scholarly sources to define a term used to analyze a primary text]: I feel like appealing to a scholarly source other than my text I learned in [FYW]. Because before, I would just . . . use the text that directly apply to . . . You know, like I read *House of Mirth* and I would only use Edith Wharton, Edith Wharton, Edith Wharton. But now, I can use other people . . . [I] rely more heavily on quotes now than I did in high school. Because before, I thought, "If I'm using all these quotes, I'm not doing my own work." . . . But I've definitely learned that using quotes, or that's what I've been told anyway, using quotes helps prove your point better to show that you have more support, that you've done your research. **(Deep)**

Metacognitive Example

> **(Interview)** *Student* [on analyzing a Dostoevsky novel]: Like, able to pick out certain parts that tie back into what [the author is] really trying to say, like the main point. . . . And once you can do that, you can . . . analyze it because you can't analyze it if you don't know what he's saying or what he's talking about. So it's not the same kind of rhetorical reading that we were doing in the essays [in FYW] . . . But it's definitely applicable in [analyzing] literature. **(Middling)**

The second of the two examples of cognition about strategy is deep because the student explains in depth what scholarly sources achieve in the text described, while the first is shallow because the student includes little such detail. Both examples are cognitive because the descriptions suggest that students use their strategies habitually and uncritically, without respect to their fit (or lack thereof) for particular writing tasks or contexts. The first of the two metacognitive examples entails explicit reflection on specific strategies (talking with the instructor, seeking comments to use in revising, and examining models) that led to success in particular circumstances; thus, it is metacognitive. The second includes explicit reference to when the strategy described (literary analysis) is applicable and to how it contrasts with other known strategies (rhetorical analysis) and so is also metacognitive. We found a noteworthy percentage of code co-occurrences linking strategy codes with person codes. Of the 146 person codes, 47 of them (32.2%) co-occurred with strategy, while of the 207 strategy codes, 47 (22.7%) co-occurred with person.

Chart 8.4. "Planning" metacognitive component and example with codes

(Meta)cognitive Component

> **Planning:** identifying a problem, analyzing it, and choosing a strategy to address it

Cognitive Example

> (Interview) *Student* [describing an unsuccessful text]: It was not really well organized. And we had to get three quotes from three left-handed people and three quotes from three right-handed people, and I had avoided until the end to put those in. And I was just like, "Oh I'll just have them support whatever I'm saying" and see if I kind of work the quote in. And that isn't how it works and so that was not a very successful first article [laughs]. (Middling)

Metacognitive Example

> **(Interview)** Because when I sat down to write my proposal [to do a Freudian reading of fairy tales], [the instructor] wanted terms and I was, like, "Oh, God. I can't choose one." So then I had to go back and reformulate. And I realized that with every term, there was a different connotation . . . I wanted to pick . . . the term that had the most bearing, meaning for my purpose. **(Middling)**

The example of cognition about planning recounts the writer's process, but because that process did not include consideration of the potential effectiveness of the approach used or of alternate approaches, we consider it cognitive. While the student's comment "that isn't how it works" implies a move toward metacognition, that move occurred subsequently, during an interview that prompted reflection, rather than during the planning process itself. But the fact that subsequent reflection prompted this move suggests that teachers can usefully encourage students to cultivate and extend such recognitions to foster metacognitive capacity, as we discuss below. Because the example of metacognitive planning includes the writer's rationale for choosing the term used (the one most relevant to the text's purpose), we consider it metacognitive.

Chart 8.5. "Monitoring" metacognitive component and example with codes

(Meta)cognitive Component

Monitoring: evaluating one's cognition and efforts toward a project

Cognitive Example

N/A

Metacognitive Example

(Interview) This year in particular . . . everyone was saying there was a huge drop in numbers [of new pledges to Greek organizations]. And I was trying to focus on that. But when I . . . went back into the facts, I looked at . . . five years back and saw that it was the last two years that [had] an irrational spike in the numbers and it wasn't that this year dropped. . . . And I think I finally, after a lot of like fine-tuning and working with [the instructor, I] was able to portray that, as opposed to just starting out by saying the numbers dropped significantly. **(Middling)**

This example entails the writer's monitoring of the development of a draft in relation to key source information and a resulting decision to shift the text's focus to present the source data more effectively (and more accurately). It illustrates the close relationship between monitoring and control, particularly as the latter code was also applied to this excerpt.

Chart 8.6. "Control" metacognitive component and example with codes.

(Meta)cognitive Component

Control: the choices one makes as the result of monitoring

Cognitive Example

(Reflection) Not being redundant posed a very big problem for our group as we eventually plateaued and entered a period of writer's block. We were able to

exit this unfortunate phase by taking several days off to rest and getting second opinions on the paper. **(Middling)**

Metacognitive Example

(Reflection) I then located an interviewee candidate and sent her the questions. They were never answered, so I relied more heavily on the sources I had and worked to find more sources when I realized they weren't enough. I met with my professor who . . . also sent an extra source my way. **(Middling)**

In the example of cognition about control, the student described how her or his writing group overcame writer's block but did not clarify whether students explicitly recognized the writer's block as such and consciously chose the strategies of taking time off and getting feedback on their draft, or whether the writer retrospectively realized that these strategies had solved the problem. In contrast, the example of metacognitive control ties the description of a problem (insufficient sources) to strategies consciously chosen to address the issue (mining existing sources more heavily, seeking additional sources, and asking the instructor to recommend sources). Of the 152 control codes, 47 (30.9%) co-occurred with monitoring codes, while 47 of 164 monitoring codes (28.6%) appearing with control codes.

Chart 8.7. "Evaluation" metacognitive component and example with codes

(Meta)cognitive Component

Evaluation: assessing the quality of a completed project

Cognitive Example

N/A

Metacognitive Example

(Interview) In this example . . . I feel I do an excellent job of providing a well-focused and well-detailed analysis of Ahlstrom et al.'s work. The first example . . . displays the author's rhetorical situation, "David Ahlstrom, a professor of management at the Chinese University of Hong Kong." In this sentence, I highlight that Ahlstrom has a position of authority to be speaking on the subject. Next, I highlight on a specific example that David Ahlstrom lists as being a barrier of entry into the China market, "that many of the government officials in China still have a strong Marxist economic background. The idea that venture capital can be used to control the factors of production violates one of the basic fundamentals of Marxism." With [this quotation], my readers know that Ahlstrom's purpose is to talk about specific barriers to the venture capital industry in China. **(Deep)**

We coded this example as deeply metacognitive evaluation because the writer assesses the quality of a specific aspect of the text through a detailed presentation of the textual features that illustrate the achievement of one of the text's key purposes, rhetorically analyzing an academic article. This kind of depth in some cases contributes to students' development of the capacity to move from the evaluation of a particular text to a more comprehensive understanding of the achievements of multiple texts across time and writing contexts and of how these achievements relate to the writer's strategies, as well as to her or his strengths and challenges.

Constructive Metacognition

We found a surprising number of demonstrations of this more comprehensive understanding, which we call constructive metacognition. Students who displayed it reflected on their texts, strategies, and sense of writerly identity across a series of writing tasks and contexts, and they typically articulated these reflections through concepts from writing and rhetorical studies. We suggest that this form of explicit metacognitive work, which uses rhetorical terms to frame an understanding of multiple writing tasks and contexts and a writerly identity may particularly support transfer. While metacognition is only one factor in promoting transfer, we believe that its efficacy is augmented when teachers link practice in working with metacognitive subcomponents to other transfer factors. Given that constructive metacognition emerges from students' integration of other metacognitive (sub)components, we understand its development as a cumulative process.

Chart 8.8. "Constructive metacognition" metacognitive component and example with codes

(Meta)cognitive Component

Constructive Metacognition: reflection across writing tasks and contexts, using writing and rhetorical concepts to explain choices and evaluations and to construct a writerly identity.

Cognitive Example

N/A

Metacognitive Examples

(Reflection) Before my first semester of college English, I had never given much, if any, thought to answering a "so-what" question in my essays. I knew that [I needed] a topic to provide an argument for and subconsciously knew

> that the topic should be important enough to catch the reader's interest, but I never realized the overall significance of the so-what question until [FYW]. In the beginning, I had difficulty providing reasons and discussions for why a person should be interested in my topic of choice. . . . Nevertheless, by examining my own curiosities within a given subject and finding gaps in between already known information, I became better at forming so-what questions. When I initially wrote my third paper, "Writing in Psychology: How Format Helps to Obtain Maximum Understanding," I knew that I wanted to have my paper concentrate on how the APA format benefitted a psychologist's writings (1). However, I understood that most people would not care about how the format helped a psychologist to write. So after further surveying my own interest . . . I discovered that I was invested in the format psychologists used because I understood that it should be beneficial in helping to [achieve] goals. I knew this so-what question would [garner] more attention because a psychologist's goal is to find solutions for problems, and just as people would want to know if a surgeon failed his MCATs, they would want to know if a flaw in a psychologist's writing could prohibit their goal from being accomplished. Although I am not perfect at coming up with so-what questions . . . I have developed and used the devices needed to produce a so-what question. **(Deep)**
>
> **(Reflection)** In the past, when I . . . faced . . . a new writing situation, I would typically try to acquire samples of texts similar to that which I was expected to produce, and then perform a rudimentary rhetorical analysis on them. If I was still unsure how to proceed, I would try to find someone familiar with the writing situation willing to divulge as much information as possible about it, and possibly even produce a quick sample for me. I have often used this technique for college writing, and it was especially helpful during my previous profession (military communications). Of course, most of the work was cognitive, with very little writing beyond the production of the required text. However, the heuristic developed during this course—performing a rhetorical analysis, interviewing an expert, and conducting an ethnographic observation, then examining the data for characteristics of writing expertise—provides me with a far more useful tool for approaching new writing situations than my previous informal methods. Indeed, my strategy for undertaking new writing situations has changed considerably since the beginning of this course, when I thought that "using basic writing skills and critical analysis, one should be able to approach any new discourse [community] confidently." If each new writing situation does in fact require me to build on my existing knowledge of writing, I am certain that the progress I made toward [using reflection to improve writing strategies] has equipped me with a much more organized, simple, and practical approach for success in any new writing situation. **(Deep)**

As these examples of constructive metacognition suggest, this category unites most of the other metacognitive components and subcomponents. We coded 35

instances of constructive metacognition. Of those, 10 (28.6%) co-occurred with strategy codes and seven (20%) with person codes. While other co-occurrences are lower, they do appear: control and monitoring, four (11%); evaluation, three (8.5%); and task/future task, two (5.7%). In these examples, both writers depict their conscious analyses of tasks, use of thinking strategies during tasks, monitoring of these strategies and of task progress, and conscious control of their strategies based on monitoring and evaluation. Further, they describe consciously considering the cumulative implications of such analyses, the resulting shifts in their writerly identities, and the potential for knowledge transfer to future writing contexts. While the first student may still occasionally struggle to demonstrate the significance of a thesis, she or he has recognized the need to do so and developed strategies for pursuing the task in various writing situations. The second student shifted from using informal strategies tacitly to using more elaborated strategies consciously and from seeing all writing situations as similar to recognizing that writing tasks change with contexts. Both examples show Yancey's (1998) constructive reflection because the students shaped writing identities by reflecting on various composing experiences. But they also reveal constructive metacognition because they discuss thinking strategies in terms of writing and rhetorical concepts to produce adaptable principles for approaching new writing situations. They show two features of constructive metacognition: the integration of metacognitive components and their articulation with writing and rhetorical concepts to shape a writerly identity.

Further, reflection seems to promote constructive metacognition. Five of the eight students whose reflections we coded displayed instances of constructive metacognition (two of those five students' writing scores declined over time and three improved). These students were relatively evenly distributed across institutions. Two came from one institution, two from a second, and one from a third. Only one participating institution did not have students who showed instances of constructive metacognition, and this lack may result from the small number of students whose data we coded for this portion of our study. The integrative nature of constructive metacognition and its clear connections to the factors of transfer indicated by prior scholarship—such as genre awareness, understanding versus rote memorization of procedures, monitoring of one's learning experience, and abstraction of principles—suggest its potential importance for understanding how successful transfer of writing-related knowledge and skills unfolds when it occurs (National Research Council, 2000; Reiff & Bawarshi, 2011; Rounsaville et al., 2008). The prevalence of this metacognitive move in our small sample suggests that it can be encouraged through curricula and pedagogies that use reflective assignments and other strategies that prompt students to practice using metacognitive (sub)components.

Learning how metacognitive representations connect to writing performance is crucial, and while our analysis is limited due to our study's primarily qualitative nature, some interesting trends emerge. We coded 33 instances of evaluation in reflections from the four students whose scores increased from the final paper in the initial course to the paper in the subsequent course (improving writers), while we coded only 17 instances in reflections from students whose scores decreased (declining writers). Similarly, we found 15 instances of planning among improving writers but only eight among declining writers. Improving writers had 13 deep codes, while declining writers had only five. Conversely, improving writers focused less on task, at 23 instances, than did declining writers, at 35. Interestingly, both groups had higher numbers of person codes than of any other code except strategy, 64 for improving writers and 54 for declining writers. Both groups gave the same level of attention to monitoring (28 codes) and to strategy (75). These numbers may suggest that metacognitive (sub)components like evaluation and planning play a particularly important role in transfer, while others like monitoring and strategy may contribute to transfer more effectively when linked to other codes, such as control and person. Improving and declining writers displayed nearly identical instances of constructive metacognition (six versus seven). Given the findings of prior research on the role of metacognition in transfer and the fact that constructive metacognition integrates other metacognitive (sub)components, we suspect that these proportions may indicate that declining writers used several metacognitive (sub)components but had not effectively integrated key components like evaluation and planning. Research on a larger dataset is needed to investigate the potential role of constructive metacognition in transfer and the relations among the metacognitive (sub)components. Nonetheless, our findings suggest both important pairings (person and strategy, monitoring and control) and key components (evaluation and planning), as well as the role of these pairings and components in writers' development of constructive metacognition.

Our examples suggest that teachers might most effectively promote constructive metacognition by helping students move toward specificity, depth, and abstraction in their reflections. More specifically, by guiding students to reflect on their cognitive processes, teachers may help students to explicitly recognize cognitive strategies they had previously used tacitly and to make conscious choices about task analysis, planning, and the selection, monitoring, and control of strategies. Similarly, by prompting students to reflect on the implications of such efforts and on their uses of reflection across writing tasks and contexts, teachers may help students to develop an explicit writerly identity based in the use of adaptable strategies tailored to specific contexts and rhetorical situations. In doing so, teachers might foster transfer by pro-

moting the consciously reflective metacognition Swartz and Perkins (1990) advocated.

A Potential Barrier to Developing Constructive Metacognition

One theme we encountered during coding reveals potential roadblocks in students' development of constructive metacognition. As prior research (Larkin, 2009) has suggested, affect may play an important role in encouraging or discouraging students' use of metacognitive (sub)components. We found a small handful of examples in which negative affect appeared to impede metacognition. In one, a student discussed at length the desire to use writing to explore a topic, rather than to make an argument, and a resulting succession of poor or failing grades on argument papers. Despite repeated feedback from instructors on the issue, the student said, "I never know that [the lack of an argument] is a problem . . . until someone tells me it is. . . . The one thing that happens in academic writing that either I don't agree with or it's hard for me to, like, wrap my head around is that writing always has to argue something." This student seems unable to reflect usefully on individual writing experiences and the connections across such experiences due to an antipathy toward a crucial requirement of most academic genres.

In a second case, a student who made many extensive metacognitive moves in the final FYW reflection, including constructive metacognition, showed minimal metacognitive awareness in an interview conducted after she or he had taken a subsequent writing course. The interview responses revealed that the student did not grasp the cumulative nature of the two courses and that he or she actively rejected a writerly identity. (The student denied having a writerly identity in response to a question about what type of writerly identity fit best.) These responses showed that the student felt deeply demoralized after the second course. The role of affect in this process was suggested by comments such as, "Last semester tore me apart; my [confidence was] shot down" and "I just felt like I kept failing," in context of a claim that revision did not seem to address the problems, based on the student's reading of instructor comments on revised drafts. As this example implies, metacognitive awareness alone does not guarantee transfer. Larkin's (2009) study of social metacognition in young writers found that writing pairs with a competitive orientation had higher levels of negative affect and lower levels of metacognition, while pairs with a collaborative orientation had a calmer affect and higher levels of metacognition. Both Larkin's findings and ours suggest that instruction in metacognition may best support transfer when integrated into curricula and pedagogies that promote other transfer factors, particularly affective factors such as motivation and self-efficacy (Latawiec, 2016).

CULTIVATING CONSTRUCTIVE METACOGNITION: IMPLICATIONS FOR TEACHERS, WRITING PROGRAM ADMINISTRATORS, AND RESEARCHERS

Our taxonomy reveals how specific metacognitive components and subcomponents operate and intersect in writing. The intersections among metacognitive components and their integration with writing and rhetorical concepts led us to propose the concept of constructive metacognition. Because our analysis suggests that it occurs relatively often when students respond to reflective prompts designed to elicit descriptions of how they used metacognitive (sub)components and rhetorical knowledge, this analysis suggests that writing instructors can design curricula and pedagogies that promote constructive metacognition. By opening Nowacek's (2011) black box of metacognition, our taxonomy provides a basis for teaching metacognitive (sub)components cumulatively, to cultivate constructive metacognition. Further, it provides tools for designing professional development and assessment approaches pitched to help instructors devise curricula and pedagogies that support students' metacognitive development and that integrate such efforts into instruction that promotes other transfer factors as well. We illustrate below how the taxonomy can be used to further such endeavors and briefly note its relevance for future research that could provide additional insights into how to teach metacognitive (sub)components in ways that foster students' writing development.

Implications for Teachers

With a deeper understanding of the metacognitive (sub)components students use as they learn to write and reflect on their writing experiences, we can develop pedagogies that encourage metacognitive development. As noted above, constructive metacognition integrates metacognitive (sub)components with each other and with writing knowledge and is linked to transfer factors identified by prior scholarship. Thus, it may promote transfer. Using our taxonomy, we propose three potential implications for fostering it by cultivating metacognitive development.

First, to structure metacognitive practice into curricula, instructors might model and elicit the metacognitive moves described in our taxonomy and design prompts that ask students to undertake these moves—for example, by showing students how instructors routinely examine their own drafts to ensure that the points of an argument support a working thesis (monitoring) and revising to better fit points to thesis (control), as well as by developing prompts that ask students to discuss their metacognitive knowledge of person, task, and strategy;

or prompts that ask them to reflect on moments of difficulty producing texts (monitoring) and how they overcame these difficulties (control). These prompts might include both reflective writing and the use of brief think-aloud protocols combined with screen capture technology to help students articulate the moves they are making—and why—as they write (see Blythe, this volume). Students should engage in this practice both as they compose individual texts and as they consider their writing development across a semester by examining their work on a series of texts. Examining examples from the taxonomy should help instructors design such prompts, and integrating them into writing curricula may promote students' development of metacognitive skills. Using the taxonomy, we've developed and are piloting a module that engages students in such practice by asking students to enact and represent specific metacognitive activities linked to each (sub)component. For instance, to introduce students to monitoring, the module asks them to read a short text; identify, summarize, apply, and/or respond to key concepts in that text; and to recognize the reading strategies they're using, analyze the efficacy of those strategies in helping them to draft the assigned text, and consider which of those strategies are serving their goals and which could be improved to better enable them to fulfill the writing assignment.

Second, metacognitive moves are linked to each other, and practicing them appears to contribute cumulatively to the development of constructive metacognition. For example, an increasing understanding of person, that is, of one's strengths and challenges as they unfold across writing tasks, seems to help students develop more sophisticated strategies and more effective monitoring and control (see the constructive metacognition examples and discussion above). Thus, instructors might usefully ask students to begin with individual metacognitive moves and then to link these moves to one another and to an evolving understanding of their writerly identities as students draft and evaluate their texts. Our metacognition module promotes this work by prompting students to practice identifying and assessing their strengths and challenges in particular aspects of writing at the beginning of the term; to assess growth in these strength and challenge areas after practicing the use of several metacognitive (sub)components; and finally to consider the implications for their progress as writers after the use of all metacognitive (sub)components. We believe that building such practice cumulatively into writing curricula may promote transfer by encouraging constructive metacognition, and we argue that practicing activities that build metacognitive competence can intersect productively with other transfer factors, such as efforts to promote positive dispositions toward writing self-efficacy and to integrate transfer cues into writing curricula.

Third, our findings suggest that metacognitive moves in writing appear to rely on knowledge of writing processes and concepts. Thus, we should link in-

struction in metacognitive moves to the teaching of key writing studies concepts, particularly genre, rhetorical situation, and the use of the writing process. Recent course designs, such as Wardle and Down's 2011 writing-about-writing approach (as cited in Beaufort, 2012), Beaufort's (2007) course outline in *College Writing and Beyond*, and the curriculum outlined in Yancey, Robertson, and Taczak's (2014) *Writing Across Contexts: Transfer, Composition, and Sites of Writing*, have made similar connections between learning to write, the mastery of writing studies concepts, and metacognitive development to promote writing transfer. For Wardle and Downs, accomplishing these interconnected objectives requires students to do the following:

> Broaden their conceptions of what writing is and how it is done, think explicitly about the affordances and constraints for the writing they face, see themselves as writers, understand the contributive and conversational nature of both reading and writing, and understand writing rhetorically. (as cited in Beaufort, 2012, "Second Consideration," para. 4)

Fostering students' understanding of writing studies concepts as a language for critically examining their writing practices can increase metacognitive awareness and flexibility, particularly in new writing contexts. Instructors might fruitfully link such efforts to other means of promoting transfer. For example, by encouraging students to investigate where and how they'll be asked to write in their intended majors and/or professions, instructors can encourage transfer in two additional ways. The first entails fostering engagement and motivation because, as Bergmann and Zepernick (2007) show, many students are focused on disciplinary courses and professional preparation. The second involves helping students understand how the concepts and skills they're developing in general education writing courses are preparing them to succeed in future contexts, a form of cueing that promotes transfer (National Research Council, 2000). Because our taxonomy offers a more detailed view of how metacognitive components operate in writing, it can both help teachers guide students in developing metacognitive competence in writing and serve as a springboard for linking such instruction to other efforts to support transfer.

Implications for Writing Program Administrators

Writing Program Administrators (WPAs) can help instructors to develop curricula and pedagogies to foster metacognition by drawing on our taxonomy in professional development and assessment programs. In designing professional development approaches, WPAs can use the taxonomy to help instructors learn

to recognize metacognitive subcomponents and to draft reflective and other assignments that ask students to practice activities associated with subcomponents like analyzing writing tasks in relation to the student's prior knowledge in order to identify knowledge and skills the student must increase to complete the assignment successfully. Such efforts should educate instructors about how metacognitive (sub)components relate to each other and support writing development. For example, our metacognition module guides students through practicing (sub)components so that they build on one another, moving from knowledge of person to knowledge of task and strategies to knowledge of monitoring and control. Further, WPAs should help instructors to link work with metacognitive (sub)components to other pedagogical approaches that promote transfer, including efforts to prompt motivation and engagement.

Finally, WPAs should use the taxonomy to develop assessment methods for learning which metacognitive (sub)components particular curricula and pedagogies help students to master, if any, and how effectively such curricula and pedagogies promote cumulative development across (sub)components. Our metacognitive module illustrates reflective assignments intended to elicit practice using particular (sub)components in a way that builds toward constructive metacognition and incorporates assessments of students' developing metacognitive capacities.

Implications for Researchers

To help teachers to foreground and build more effectively on students' existing metacognitive capacities, further research should investigate more fully what metacognitive moves students are already making. We suggest this focus in part because we believe that students engaged in metacognitive thinking far more often than was represented in their reflective writing and interview data. For example, in the case of monitoring, we saw a difference between *representations* of monitoring and *actual* monitoring. We saw the outcome of monitoring behavior, where a student exhibited a behavioral change but did not describe the process that led to that change.[5] As a result, we know some monitoring happened but was not represented in students' descriptions. This lack reveals a limitation of asking students to reflect after the fact, either through a writing process reflection or through an interview.

However, a more fruitful approach for both future research and instruction in metacognitive moves tailored to writing emerged through our study. At one site, a researcher did extended interviews that included a think-aloud protocol in which students discussed a current writing assignment. We included two of these protocols in our sample, and in coding them, we found a wider range

of metacognitive moves—especially planning, monitoring, and control—than we saw in other interviews and reflections. The need to capture data on metacognition during the process of task completion is emphasized by Georghiades (2004):

> In order to measure "knowing about knowing" "more accurately" it has been suggested (Ericsson & Simon, 1980; Garner & Alexander, 1989) that researchers should use multiple methods that do not share the same source of error. Garner and Alexander proposed three ways of finding out what children know about their cognitions: (a) asking them, (b) having them think aloud while performing a task, and (c) asking them to teach a younger child a good solution for a problem. (1989, p. 374)

Similarly, we suggest that asking students questions as they write (through think-aloud protocols) or asking them to record their writing processes can help us understand students' use of metacognitive components, much as Nowacek (2013) argued in saying that researchers should investigate students' composing processes by studying writing center tutoring sessions. The metacognition module we've developed uses this approach.

Finally, to better understand students' existing metacognitive moves, additional research on code co-occurrence is also needed. We noted co-occurrence in our taxonomy, and learning which metacognitive subcomponents appear to be linked even without instruction could support the design of pedagogies likely to promote metacognition.

CONCLUSION

By showing how metacognitive components operate in writing, our taxonomy clarifies metacognition's role in writing development and provides an important tool for helping students to cultivate metacognitive capacities that support writing development. Our findings on constructive metacognition reinforce Scott and Levy's (2013) stress on the relationships among metacognitive components. They suggest that metacognitive capacities develop cumulatively and support the growth of a conscious writerly identity, potentially promoting writing knowledge transfer. By developing curricula and pedagogies that engage students in practicing activities associated with each (sub)component, instructors can shift students away from the teacher-pleasing often associated with reflective assignments and into concrete discussions of specific metacognitive moves. By sequencing such practice to help students extend their work with (sub)components like person

and task, instructors may facilitate students' mastery of (sub)components like monitoring and control. By incorporating prompts asking for evidence-based accounts of changes in students' capacities to use particular (sub)components and the impact of such changes on students' writing performance, instructors can guide students toward developing constructive metacognition. Finally, by situating such efforts in curricula that promote other transfer factors, like motivation, engagement, and writing self-efficacy, instructors can embed instruction in metacognition into a holistic effort to encourage writing transfer.

NOTES

1. We understand metacognitive moves and metacognitive (sub)components as related, but distinct, terms. As we discuss below, metacognitive (sub)components name specific metacognitive processes. Representations of these processes appear as metacognitive moves in students' reflective writing and interview responses.
2. While Scott and Levy (2013) did not address all of the terms psychology researchers have used to discuss metacognition, their set included those most used by prior researchers. Although the terms *declarative, procedural*, and *conditional knowledge* described by Schraw (1998) were not explicitly listed, Scott and Levy's categories of knowledge and evaluation implicitly involved declarative and conditional knowledge, while their categories of planning, monitoring, regulation/control, and evaluation implicitly included procedural and conditional knowledge.
3. Scott and Levy's (2013) study showed that these five components can be measured through an instrument that gauges two factors, knowledge and regulation/control, and it acknowledged the importance of all components.
4. For the sake of brevity, we refer to Scott and Levy's (2013) regulation/control as "control" throughout the rest of our text.
5. Note: We coded these moves as "control" even when we could not see the monitoring associated with those changes.

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