

# Transfer of Learning and Constructive Metacognition: A Taxonomy of Metacognition for Writing Studies

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## Overview:

**Cognition** involves thinking to perform a task, while **metacognition** entails reflection on that thinking, its efficacy, and/or its outcomes. Metacognitive practices have been linked to writing transfer by writing studies scholars (Negretti, 2012; Nowacek, 2011; Reiff & Bawarshi, 2011; Wardle, 2009; Driscoll, 2011; Driscoll and Wells, 2012; Beaufort, 2007). The Writing Transfer Project study (from which the current dataset and study derives) revealed that metacognitive awareness was a statistically significant aid in students' ability to transfer writing transfer beyond initial writing courses (Jones, et al, under review). However, in the field's understanding of metacognition remains fuzzy (Nowacek, 2011).

**Goals.** The goal of this study was to develop a formal taxonomy that defines and articulates the various components of metacognition in responding to writing (both via interviews and reflections). Our taxonomy is based on Scott and Levy (2013) and is rooted in qualitative understandings from the Writing Transfer Project Dataset (Please note: I have a separate handout on the broader project and some of our findings for those interested).

## Research Questions:

- What does a taxonomy of metacognition in writing studies look like?
- When and how do metacognitive moves occur in students' A) reflections and B) talk about writing?
- Are there critical concepts in metacognition that connect more explicitly to transfer of learning?

## Methods

We focused on developing our taxonomy from two types of data in our set that we believed were most likely to include such representations. We also chose these two document types because we wished to represent both the kinds of data writing transfer researchers often collect (interviews with students and analysis of student writing) and the kinds of data that teachers of writing are most likely to encounter (reflective writing).

## Dataset: Sampled from the Larger Writing Transfer Project Dataset

- Selection of two students' sets of materials from each university

- One student whose written performance improved in year 2 (Selected randomly within that group)
    - One whose written performance declined in year 2 (selected randomly within that group)
  - Examined students' final reflective prompts (N=8) and students' interviews (N=8)
- **Approach: Qualitative Coding**
  - In-depth qualitative examination of metacognitive moves using collaborative coding methods articulated by Smagorinsky (2008)
  - Developed initial taxonomy/coding glossary starting with Scott and Levy's broader metacognitive taxonomy (used in psychology and education, not specific to writing or this kind of data).
    - Tested initial taxonomy on materials not included in the sample and refined language
- **Analysis:**
  - 40+ hours of coding by three co-researchers to apply the taxonomy to the 16 documents and make additional revisions as needed
    - Collaborative coding on all 16 documents
    - Achieved 100% inter-coder reliability because coders do not move forward until there is complete agreement
  - **Qualitative** descriptions and examples of the metacognitive moves to develop taxonomy
  - **Quantitative** examination of writing performance and patterns of metacognitive awareness (based on number of coded instances)
  - **Quantitative** examination of code co-occurrences, where two or more codes appeared in the same text segment to examine relationships between codes
- **Limitations**
  - **Self-Reported Data:** Use of retrospective, self-reported data (interviews and reflections); provided good information on metacognitive knowledge and some forms of metacognitive regulation
    - Nowacek (2011) noted that retrospective data limits access to students' use of metacognitive components during the writing process (we completely agree)
  - Emphasis was on developing a taxonomy of metacognitive moves
  - Did not code extensively in the larger dataset to assess the taxonomy's broad generalizability (this work is forthcoming)
  - Self-reported data: Non-conscious thoughts and reporting relevant information (Georghiadis, 2004)

# A Taxonomy of Metacognition for Writing Studies

## 1. Cognition vs. Metacognition:

- Cognition entails thinking to complete a task.
- Metacognition involves critical reflection on that thinking, and its efficacy or outcomes.
- We found that some components in the taxonomy can be cognitive or metacognitive while others can be inherently metacognitive:
  - **Cognitive or metacognitive components:** Task, Planning, Control, and Strategy
    - These are cognitive in nature when used habitually or uncritically
  - **Inherently metacognitive:** Person, Monitoring, Evaluation, and Constructive Metacognition.

Cognitive Understanding of Planning	Metacognitive Understanding of Planning
<p>(Interview) <i>Student is describing an unsuccessful text:</i> 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....”That isn’t how it works. It was not a very successful first article [laughs]. (Shallow).</p>	<p>(Interview) Because when I sat down to write my proposal [to do a Freudian reading of fairytales], [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)</p>

## 2. Shallow, Middling, Deep:

- **Levels of Detail in Metacognitive Awareness:**
  - **Deep:** Instances of metacognition included substantial depth and detail and understanding of self.
  - **Shallow:** Instances of cognition/metacognition that are shallow and only on the surface.
  - **Middling:** Instances included a middling level of detail and therefore were not coded as either deep or shallow (the majority were middling)
- **Tentative Findings:**
  - Improving writers were twice as likely to engage in deep metacognition (13 instances of deep vs. 7 instances of shallow)
  - Deep understandings were found throughout our dataset; but not in the quantity we had hoped to see. Deep understandings were more frequent in interviews than in end-of-term written reflections.

### 3. Metacognitive Components and Examples

Metacognitive Subcomponent	Definition
<b>Person</b> (Knowledge of Cognition)	<p><b>Definition:</b> Knowledge of oneself as a writer, including one's successful/unsuccessful use of genres, conventions, and rhetorical and writing process strategies</p> <p><b>Example (Interview)</b> 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. Yeah. 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. <b>(Deep)</b></p>
<b>Task</b> (Knowledge of Cognition)	<p><b>Definition:</b> Understanding of affordances and constraints posed by a project and its circumstances</p> <p><b>Example: (Interview)</b> 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. <b>(Middling)</b></p>
<b>Strategy</b> (Knowledge of Cognition)	<p><b>Definition:</b> Knowledge of the range of approaches one might effectively use to complete a project</p> <p><b>Example: (Interview)</b> Student [responding to a question about what helped her/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. <b>(Middling)</b></p>
<b>Planning</b> (Regulation of Cognition)	<p><b>Definition:</b> Identifying a problem, analyzing it, and choosing a strategy to address it</p> <p><b>Interview)</b> Because when I sat down to write my proposal [to do a</p>

	<p>Freudian reading of fairytales], [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.</p> <p><b>(Middling)</b></p>
<p><b>Monitoring</b> (Regulation of Cognition)</p>	<p><b>Definition:</b> Evaluating one’s cognition and efforts toward a project</p> <p><b>Example: (Interview)</b> 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 were just in like 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. <b>(Middling)</b></p>
<p><b>Control</b> (Regulation of Cognition)</p>	<p><b>Definition:</b> The choices one makes as the result of monitoring</p> <p><b>(Reflection)</b> 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. <b>(Middling)</b></p>
<p><b>Evaluation</b> (Regulation of Cognition)</p>	<p><b>Definition:</b> Assessing the quality of a completed project</p> <p><b>(Interview)</b> 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 that I have 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 sample of the text, my readers know that Ahlstrom’s purpose is to talk about specific barriers to the venture capital industry in China. <b>(Deep)</b></p>
<p><b>Constructive Metacognition</b></p>	<p><b>Definition:</b> Reflection across writing tasks and contexts, using writing and rhetorical concepts to explain choices and evaluations and to construct a writerly identity</p> <p><b>Example (Written Reflection) (Deep)</b> 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</p>

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)**

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