CHAPTER 14

RESEARCHING HABITS-OF-MIND SELF-EFFICACY IN FIRST-YEAR COLLEGE WRITERS

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I do not think of myself as someone who studies cognition but rather metacognition.[1] I mention this because I suspect that I'm not alone in feeling more drawn to the latter than the former of these concepts, and it may be worth exploring why. For starters, *cognition* can be a mystifying term. At times the word just seems to mean *thinking*; at other times it entails emotions, non-emotional affect, and even assimilated social influences. So this word that denotes the thinking of a single person can also paradoxically connote the opposite of thinking and involvement of other people. But *metacognition* doesn't appear more inviting to comprehension. After all, this word encompasses its already confusing root term and further complicates it with a prefix meaning *among*, *with*, *after*, or *beyond*. This turns out to be a troublesome set of prepositions.

On the one hand, when we become aware of our thoughts, our perception might be said to be *among* or *with* those thoughts (i.e., together with them); this makes it difficult to distinguish cognition from metacognition. In such a state of mutual company, cognition appears to be knowable. Ann Berthoff (1984) seems to assume as much in her refrain "thinking about thinking" (p. 743), which was my first point of entry into metacognition per se. On the other hand, becoming aware of our thoughts indicates our perception's state of being *beyond* or *after* those thoughts (i.e., separate from them); this makes it difficult *not* to distinguish cognition from metacognition. As Howard Tinberg (2016) recently put it, "Metacognition is not cognition. Performance, however thoughtful, is not the same as awareness of how that performance came to be" (p. 75). When Linda Flower and John R. Hayes (1981) introduced their cognitive process theory, it

didn't take very long for scholars to argue that we cannot directly access cognition without altering it through the act of observation (Pierstorff, 1983, p. 217), a theory that suggests that cognition is unknowable.

I am not prepared to survey related debates in epistemology, but I do have ideas on why I feel more at home with metacognition than cognition, and why that matters. For some of today's emerging compositionists, scholarship on writing and cognition may seem somewhat passé—a pre-social-turn relic—if not also foreign (think fMRI labs). I confess that for me the pairing of cognition and writing has sometimes been just a vague metonym for a minor rite of historical coverage in grad school, not an everyday concern in my own classrooms. By contrast, *metacognition* and its cognates, especially *mindfulness*, appear to be everywhere these days, both in and outside of academe. We encounter metacognition playing important roles in genre theory, activity systems, transfer studies, writing about writing, and of course the *Framework for Success in Postsecondary Writing* (CWPA et al. 2011). Even my first-year writers regularly accept the task of demonstrating "metacognition" in their portfolio cover letters without bristling particularly.

So it may be that familiarity through exposure is why I feel more drawn to metacognition than to cognition. This possibility strikes me as important because, if it is true of others, then the arguably greater freshness and lesser resistance or baggage associated with metacognition, relative to cognition, could allow contemporary writing scholars easier passage into this general area of study, and potentially afford them more effective applications of their findings. In other words, that troublesome prefix, *meta-*, might be a ticket for cognition back into the mainstream of writing studies, or at least for something like cognition to come closer to the equivalent of a mainstream in today's increasingly specialized discipline. This could be promising especially for writing scholars pursuing deeper ties with the sciences and publics.

Where I see my present work in this scheme is closer to an experimental than a theoretical end of a spectrum, along which I believe there is need and room for a diversity of approaches. I began a study in 2013 that investigates possible effects of prompted metacognition on self-efficacy in first-year writing (FYW) students. The focus of this reflection is on the habits of mind of the *Framework* (CWPA et al., 2011): creativity, responsibility, engagement, metacognition, persistence, curiosity, openness, and flexibility. I want to better understand these habits' potential to counterbalance some habituated effects of high-stakes testing and test prep on American students, namely: the *suppression* of traits such as creativity, engagement, and curiosity. Irene Clark's excellent chapter in this volume deepens my faith in my study design, which originated in only an intuition of "neuroplasticity," whereby the forming of new habits in FYW may replace old ones formed by tests that are ironically administered in the name of

college readiness. Readers may be familiar with Carol Dweck's (2006) version of this kind of neuroplasticity called "growth mindset," whereby innate intelligence and capability are developed through determined practice. I have chosen to examine self-efficacy rather than performance itself in order to avoid assessing students' habits of mind, and also because positive correlations are known to exist between writing self-efficacy and performance. This chapter will explain my study's design and selected results, but first I offer a review of relevant literature to justify my focus on self-efficacy, to familiarize readers with the concept, and especially to invite further research in this area.

I want my study to inspire writing teachers to habituate students' metacognition on their habits of mind, and to effectively promote this practice beyond their classrooms in whatever forms may be locally or individually appropriate—whether that be humanistic (Johnson, 2013), posthumanistic (Boyle, 2016), or otherwise. In order to increase our impact on popular opinion and secondary curricula that are facing Common Core State Standards-aligned tests, proponents of the Framework would do well to publicize valid and reliable research in addition to other forms of evidence. If taken literally and in the vein of social science, as I take it, the phrase *empirical research* indicates a systematic pursuit of understanding based on experiment or practice, not a quest for immutable Truth. Furthermore, *statistical significance*—a measure of reliability, or reproducibility, or the chances that a studied effect is well beyond random—technically identifies an experimental finding that is not definitive proof itself but is potentially meaningful and deserving of confirmation by other researchers (Frost, 2014, Guideline 2 section; Nuzzo, 2014, Out of Context section). A significant finding is potentially only one piece of a large puzzle that requires a very gradual putting together, as Charles Bazerman notes in this volume.

I take such literal and limited approaches to the use of empirical evidence. Yet I still see value in such research in the present case not only for fighting with fire the testing industry's ample psychometric data, but also for projecting a kind of self-scrutiny that is becoming of professionals who seek better public understanding and respect. If we want students, parents, and high schools to value metacognition on the *Framework*'s habits of mind, then we ought to present a variety of convincing evidence in support of this practice, including the use of valid and reliable research. The next section provides important context and precedents.

SOCIAL COGNITIVE THEORY AND WRITING SELF-EFFICACY

Social cognitive theory (SCT) is a model of human agency that is closely associated with Stanford psychologist Albert Bandura. SCT aims to predict some

human behavior by measuring people's perceptions about their ability to complete a given task (Bandura, 1986, p. 18; 1997, pp. 2-3). Specifically, according to the social cognitive view, behavior is not fixedly sourced by people's biological condition any more than it is the creation of a truly random and internal thought process; rather, behavior is the gestalt result of a three-part dynamic whose equally operative components are "behavior, cognitive and other personal factors, and environmental events" (Bandura, 1986, p. 18). This is known as a "triadic reciprocality," a type of reciprocal determinism in which the model's constituent parts each determine the quality of their counterparts and so forth in a positive feedback loop (Bandura, 1986, p. 23). By "determinism" Bandura means each part contributing to the operation of the other two, not an inevitability to human behavior.

SCT rejects any conceptual insolvency in its simultaneous assertions that behavior is reciprocally determined and that freedom in human agency is real (Bandura, 1997, p. 7). As Bandura (1997) explains, "Freedom is not conceived negatively as exemption from social influences or situational constraints. Rather, it is defined positively as the exercise of self-influence to bring about desired results" (p. 7). It is this capacity for "self-influence" to impact a person's behavior that warrants SCT's orientation around perception of their own efficacy in making predictions about future behavior (Bandura, 1986, p. 20; 1995, pp. 2-3). This self-influence guides behavior because information that an individual may have about the reasonability of performing an action does not immediately compel subsequent engagement in it; instead, this information "becomes instructive only through cognitive processing of efficacy information and through reflective thought" (Bandura, 1997, p. 79).

Operationally defined, "perceived self-efficacy is a judgment of one's capability to accomplish a certain level of performance" (Bandura, 1986, p. 391). This is an important metric to consider when attempting to predict or influence behavior because research on people's perceptions of their efficaciousness in performing a given task shows that these perceptions determine whether or not the people try to complete the task, how often they do so, how much effort they put in, how much effort they expend in the face of related difficulty, their feelings of reward or success at the task's conclusion (feelings that encourage or discourage subsequent behavior), and their feelings before and during performance of the task (Bandura, 1986, pp. 393-394; 1995, p. 2; 1997, p. 3). A person's efforts in completing a task can be more a function of what that person perceives about their own capability than a result of what is actually true about their capability (Bandura, 1995, p. 2).

Self-efficacy beliefs originate from four sources: mastery experiences, vicarious experiences, social persuasion, and physiological/emotional states (Bandura,

1986, p. 399; 1995, pp. 3-4; 1997, p. 79). The first source, mastery experience, is the sum total of any personal memory or experience a person has with completing a given task (Bandura, 1986, p. 399; 1995, p. 3; 1997, p. 80). Research has been unequivocal about the primacy of mastery experience as a contributor to a person's self-efficacy beliefs, in that no other researched source has been shown to influence a subject's perception of self-efficacy more than the direct knowledge of what it is like to attempt to complete the task at hand (Bandura, 1977, pp. 195-196; 1986, p. 399; 1995, p. 3; 1997, p. 80; Pajares, Johnson, & Usher, 2007, 113). The second most influential source of an individual's self-efficacy is vicarious experience, meaning the observed or otherwise modeled behavior of a person other than the individual him or herself, performing the given task (Bandura, 1977, pp. 197-198; 1986, pp. 399-400; 1995, pp. 3-4; 1997, p. 86). The third most significant source of self-efficacy belief is verbal/social persuasion, which is when someone other than the subject tries to convince the subject that he or she has the requisite efficacy in whatever skills are needed to complete a task (Bandura, 1977, p. 198; 1986, pp. 400-401; 1995, p. 4; 1997, p. 101). The last and least influential source of self-efficacy belief is the subject's emotional or physiological state, which is the feeling that the subject perceives both viscerally and affectively in the moment when they are expected to complete the task at hand (Bandura, 1977, pp. 198-199; 1986, p. 401; 1995, pp. 4-5; 1997, p. 106).

THEORETICAL CONTESTATIONS OF SELF-EFFICACY

A recurrent trope in self-efficacy literature is the need to differentiate the central construct of SCT from other constructs. The most commonly cited example is that of outcome expectancies, meaning the expectations an individual has about the consequences that would follow from engaging in a behavior (Bandura, 1997, pp. 125-126; Schunk, 1990, p. 3). Proponents of SCT note that an individual's expectations about outcomes that follow from engaging in a task are different from that individual's expectations about their ability to take the task to completion in the first place (Bandura, 2006, p. 309; Pajares, 1997, p. 5; Schunk, 1990, p. 4). Others see a circular logic in this separation of perceived outcomes of task completion from the perceived willingness to engage in it, since the former inevitably influences the latter (Pajares, 1997, p. 6). SCT supporters respond by noting that if perceptions of self-efficacy for a given task and expectancies about the outcomes of completing said task are indeed linked, then self-efficacy would be the dominant construct since "one cannot conjure up outcomes without giving thought to what one is doing and how well one is doing it . . . foresight requires a causal ordering" (Pajares, 1997, p. 6). Many researchers

claim to have statistically shown through experimentation that self-efficacy remains a stronger predictive construct than outcome expectancy when it comes to writing (Pajares & Johnson, 1994, p. 325; Shell, Colvin, & Bruning, 1989, p. 96; Shell, Colvin, & Bruning, 1995, p. 395, 397; Zimmerman, 2000, p. 84).

Another disagreement pertains to terminology. SCT supporters complain of the repeated presentation of constructs such as self-esteem or self-concept as self-efficacy. The numerous facsimiles of self-efficacy include: self-concept of ability, performance expectancies, perceptions of competence, perceptions of task difficulty, self-perceptions of ability, ability perceptions, perceived ability, self-appraisals of ability, perceived control, and subjective competence (Pajares, 1996, p. 550; 1997, p. 10). The argument is that these psychological traits are too global to be relevant to self-efficacy perceptions because self-efficacy is always a particularized and context-dependent measure of task confidence that cannot be generalized to the degree achieved by these expansive self-estimates (Bandura, 2006, pp. 307-308; Pajares, 1996, pp. 560-561; Pajares & Johnson, 1994, p. 323; Zimmerman, 2000, p. 84). Many supposed publications about self-efficacy beliefs are critiqued by SCT proponents as failing to establish the requisite standard of task-specificity (Pajares, 1996, pp. 550-551; 1997, p. 7; 2003, p. 148).

TRENDS IN WRITING SELF-EFFICACY RESEARCH

There is ample research on the topic of self-efficacy as a predictor of writing ability. This is not surprising given that Bandura himself describes writing as a task that is quite dependent on the internally iterative thought processes that self-efficacy beliefs moderate:

> The act of writing is a familiar example of a behavior that is continuously self-regulated through evaluative self-reactions. Writers adopt a standard of what constitutes an acceptable piece of work. Ideas are generated and rephrased in thought before they are committed to paper. Provisional constructions are successively revised until authors are satisfied with that they have written. The more exacting the personal standards, the more extensive are the corrective improvements. (1978, p. 350)

This sentiment is echoed in published results of self-efficacy research on the construct's power to be predictive of writing performance. Postsecondary students who score highest on inventories of writing self-efficacy beliefs in studies earn better grades on essays than students with lower self-efficacy scores (Hetthong & Teo, 2013, p. 162; McCarthy, Meier, & Rinderer, 1985, p. 468; Pa-

jares, 1996, pp. 552-553; Pajares, 2003, pp. 144-145; Zimmerman & Bandura, 1994, p. 856). Explanations for such a phenomenon echo the self-evaluative hypothesis by reporting results that show students who frequently score low on both writing assignments and measures of their efficacy beliefs in writing may be succumbing to an internalized helplessness that undermines the level of effort they put into such work (Lavelle & Zuercher, 2001, pp. 376, 383).

In addition to the strong predictive power of writing self-efficacy to larger school populations, research has also examined how well the construct applies to populations varying by specific demographic factors. A study of postsecondary students distinguished by ethnicity found that students from different cultural or socioeconomic strata maintain different beliefs about the causal relationship between belief and performance in writing tasks when compared to a white, middle-class sample—though only beliefs were studied; no experimental data on how these perceptions affected in-situ writing performance was collected (Murphy & Shell, 1989, p. 7). A later pilot study at a technical college aimed to examine whether instruction that was modeled around SCT and the increase of self-efficacy beliefs for writing performance could serve as an intervention for academically at-risk black and Hispanic students found that it yielded an 80% pass rate compared to the 60% pass rate produced by a control group of students who took the traditionally structured course offered by the school (Campillo & Pool, 1999, p. 6).

Other studies on writing self-efficacy have controlled for age in attempting to examine the behaviorally predictive dimensions of the construct. A study found that between ages 7 and 8, students confused social conformity and high levels of effort with academic skill and that it is not until ages 10-12 that they begin to demonstrate concept-specific perceptions of different academic abilities such as actual proficiency in math or reading (Paris & Newman, 1990, pp. 89-90). At this point, results from various studies diverge. An initial study documented that writing self-efficacy beliefs increase with grade level from elementary school to high school, mirroring the students' total improvement in cognitive processing over time (Shell et al., 1995, p. 395). A later study showed writing self-efficacy beliefs declining in students transitioning between elementary school and middle school before crystallizing at that point for the entirety of high school, making middle school a prime target for interventions (Pajares et al., 2007, p. 115).

Another area in which results have been mixed pertains to the role that writing self-efficacy plays in postsecondary students for whom English is a foreign language. Recent studies examining smaller sample sizes of these students have found evidence that self-efficacy beliefs do indeed predict future writing performance, nationality notwithstanding (Hashemnejad, Zoghi, & Amini, 2014, p. 1049; Hetthong & Teo, 2013, p. 159). Yet a slightly older project with an

unusually large sample of students, which aimed to study self-efficacy and writing center visitation, found that a cohort of international students who scored lower on writing self-efficacy scales received much better grades in writing than their domestic counterparts did. The authors of this study speculate that the international students' self-awareness of their need to compete in class with native English speakers—reflected in their low self-efficacy scores—drove them to visit the university writing center more often. Writing center visitation was the only variable that predicted later writing performance across both international and domestic cohorts in the publication (Williams & Takaku, 2011, pp. 12-13).

Gender, as a demographic variable, has also produced observable trends in this literature. Initial publications on the topic identified that girls report higher writing self-efficacy than boys do through middle-school (Pajares, 2003, p. 148; Pajares et al., 2007, p. 115); however, an analysis of such results found that a gendered quality to the predictive power of writing self-efficacy became statistically insignificant when the students' prior academic success was factored in (Pajares, 2003, p. 149). Additionally, by the time students reach the postsecondary level, gendered qualities to their self-efficacy beliefs may have dissipated, as studies of this demographic variable at the later stages of schooling fail to find any relationship between gender and the predictive power of self-efficacy in writing performance (Hashemnejad et al., 2014, p. 1049; Williams & Takaku, 2011, p. 13).

PEDAGOGICAL APPLICATIONS

Collectively, this body of research on self-efficacy's predictive power has led SCT researchers to propose many pedagogical recommendations for improving students' writing performance. The most frequent and agreed-upon of these is a recommendation to replace or supplement the conventional first-day diagnostic essay with a survey of students' perceptions of their writing self-efficacy. The rationale here is to avoid measuring performance without insight into effort (Bandura, 1995, p. 215; McCarthy et al., 1985, p. 470; Pajares et al., 2007, p. 328; Zimmerman & Bandura, 1994, p. 858). Another suggestion based on this research is to focus student conferences on short-term rather than long-term goals since SCT research has shown proximal goals to elicit greater student effort than distal goals do, which can seem abstract. Also process-oriented goals positively correlate with improved academic performance as compared with control groups who receive product-oriented goals in conferences or had no conferences at all (Campillo & Pool, 1999, p. 4; Schunk, 1990, pp. 4-6). Other SCT researchers use their results to call on administrators to endow primary and secondary teachers with greater authority over curriculum, eschewing what Pajares

refers to as "lockstep" and "scripted" approaches to literacy instruction that send students to college with low writing self-efficacy beliefs and prejudice against their own abilities to learn (McLeod, 1995, p. 380; Pajares et al., 2007, p. 116).

The aggregate message from research on SCT is that self-efficacy is indeed a predictive construct for writing performance. This includes a large number of studies across decades, subject populations, and experimental designs, though measured effects have fluctuated with each of these variables. Evidence suggests that principles of SCT can yield a significant effect on improving the performance of writing students; however, as with all empirical research, the studies reported here require further analysis in order to achieve greater validity and reliability status.

MY RESEARCH STUDY

RESEARCH DESIGN

From spring 2013 to spring 2015, I conducted a study using online survey-based rating scales and free response questions with the aim of identifying potential effects of regularly prompted metacognition on FYW students' habits-of-mind self-efficacy regarding specifically their academic writing. The basis of evidence is comparisons of pre- and post-semester self-rating scores from (1) a test group that received bi-weekly metacognitive "treatments" about the habits of mind between the pre- and post- surveys over a semester, (2) a comparison group that received placebo treatments prompting metacognition about subjects other than the habits of mind, and (3) a control group that received no intervening treatments of any kind. All three groups were extremely well matched with each other at the outset of the study, and they showed equivalent course satisfaction at the end.

Subjects during this period included students at a flagship public doctoral highest-research-activity university in the northeast US. What is reported below represents a small selection from my available data, which my limited resources and time have enabled me to work on so far. This includes various analyses made of responses from 16 test groups between spring 2013 and spring 2015. The 103 participants in this subject pool include 62 freshmen, 25 sophomores, 11 juniors, four seniors, and one subject with an unknown class status.

After receiving human subjects research certification and IRB-approval, I recruited teachers of different sections of the same FYW course, awarding a stipend for their efforts in facilitating my blinded study. To minimize the potential influence of facilitating teachers on results, I worked only with instructors who taught no fewer than two sections of the same FYW course in the given semester, designating at least one of their sections as a test group and at least one as a

comparison group (unbeknownst to teachers and students). The control group, which took only first and last week surveys, was drawn from a general call to other sections of the same FYW course.

The study's treatments consisted of five-minute freewriting sessions and related Likert scale questions that defined the given habit of mind or placebo topic. These occurred roughly bi-weekly over a 15-week semester, totaling seven installments between the pre- and post- surveys in the first and last weeks of each term. Subjects' incentive—beyond any intangibles they may have inferred as resulting from metacognitive exercises—was a chance to win a $50 Amazon.com gift card randomly awarded to a study participant at the end of each semester. Facilitating instructors were strictly forbidden from coercing participation, and they never knew which of their students was involved in the study or not. Those who declined to participate were asked to freewrite inconspicuously in a private forum while participants used the study's online surveying forum.

LIMITATIONS

Because my study took place in the "natural" context of FYW classrooms rather than a controlled setting, it needed to be as unobtrusive of class time as possible; hence, the limitation to only bi-weekly intervals and five-minute sessions. Furthermore, because my IRB required that participation in the study be optional, several related potential effects on the subject pool must be acknowledged. For one thing, there could be a self-selection bias, in that results reflect only those students who chose to participate in the study. Attrition is another factor. Effects could not be measured in subjects who began the study but did not finish it. Nor did I include data from subjects who missed more than one of the seven treatments. So my selection criteria required completion of the first and last week studies and completion of at least six of the seven intervening sessions.

Untrackable enrollment fluctuations over each semester and the impossibility of documenting attendance exactly across so many sections of FYW force me to have to estimate the participation rate among recruited subjects at 41% (using baseline of 17 students per section capped at 20). Limited resources also restricted the number of participating sections, with a total of 30 between spring 2013 to spring 2015. I paused the study in spring 2014 to analyze initial findings and decide on how to proceed. In proceeding, the only adjustment made was to subsequently guide subjects' free response "treatments" with specific prompts, which had previously been open. This change accounts for fluctuation in the base size in some calculations because 83 participants were given a "guided" prompt, and 20 were given an "open" prompt for explaining their answers generally (see Figure 14.1).

Measures

First-Week Survey

Habit of mind measures. These measures assessed the extent to which participants believed they possessed each of the habits of mind as academic writers ("Regarding your academic writing, how curious/responsible/flexible/engaged/open/creative/persistent do you think you are?"). Participants responded on a 5-point scale ranging from *not at all* to *extremely* (e.g., curious).

End of Semester Survey

Habit of mind measures. Identical habit of mind measures from the first-week survey were given to participants in or near the last week of the semester.

Course satisfaction. Participants were also asked in this survey to rate their overall satisfaction with the course. Participants responded on a 5-point scale.

Mid-Semester Survey

Habit of mind importance measures. Of the 103 participants, 83 received three questions that assessed the extent to which they believed each habit of mind is important (if at all) for achieving their intention, addressing an audience, and communicating in a context with regard to academic writing. This adjusted treatment prompt is derived directly from the *Framework's* description of rhetorical knowledge, which is distinguished as the very "basis of good writing" and elaborated as "the ability to analyze and act on understandings of audiences, purposes, and contexts in creating and comprehending texts" (CWPA, et al., 2011, p. 6). Participants responded again on a 5-point scale. A mean score of these three measures was also calculated to establish an average importance value. The *Framework's* eighth habit of mind, metacognition, was not included in the mid-semester surveys because of the would-be confounding effect of prompting and then measuring the occurrence of metacognition.

Findings

Preliminary findings suggest that the modest classroom treatment in my study shows some effectiveness in improving students' habits of mind self-efficacy with regard to their academic writing. Week 1 to week 15 self-rating scores from test group sophomores, juniors, and seniors provide statistically significant evidence that the bi-weekly five-minute metacognitive sessions did correlate with improved habits of mind self-efficacy, as a whole, and in five of eight of the individual habits. This effect was not found in test group freshmen or in the control group. The placebo group showed gains, but these were not significant in any of

the habits except metacognition, perhaps predictably, given the metacognitive study treatment. There was also a very high degree of positive correlation between the improvements of the test group's self-efficacy ratings and their overall course satisfaction, $p=.007$ (p meaning the probability the effect is by chance, i.e., less than 1% here). This means it is very likely that feeling efficacious about their habits of mind is related to students' satisfaction with their FYW course.

First-Week Habits of Mind Ratings as Predictors

A series of regression analyses was conducted to predict each of the three mid-semester importance ratings (i.e., achieving intention, addressing audience, communicating in context), average importance rating, and the word count in the free response question from each of the habit of mind ratings in the first week. The same types of analyses were conducted to predict course satisfaction and each habit of mind rating at the end of the semester.

Curiosity. Findings suggested that first-week curiosity rating was a significant predictor of achieving intention measure, $p < .05$, such that increase in curiosity rating was associated with increase in perceived importance of curiosity in achieving intention. This finding remained significant even when academic year in college was controlled for. In other words, regardless of their year in college, subjects' curiosity ratings in the first week were positively associated with the importance they assigned to curiosity in achieving their intention in academic writing. First-week curiosity rating was also a significant predictor of word count, $p < .01$, such that as curiosity rating increased, the more participants wrote about the importance of curiosity mid-semester. This association was significant even when controlling for participants' year in college.

Openness. Findings suggested that first-week openness rating was a significant predictor of word count, $p < .05$, such that as openness rating increased, the more participants freewrote about the importance of openness in mid-semester. However, this association was no longer significant when controlling for participants' year in college.

Creativity. Findings suggested that first-week creativity rating was a significant predictor of communicating in context rating, $p < .05$, such that creativity rating predicted greater perceived importance of creativity in communicating in a context in academic writing. This association remained significant even when controlling for year in college.

Persistence. Findings suggested that first-week persistence rating was a significant predictor of the addressing audience measure, $p < .01$, such that persistence rating predicted greater perceived importance of persistence in addressing an audience in academic writing. This association remained significant even when controlling for participants' year in college.

Course Satisfaction as a Predictor. A series of regression analyses was conducted to predict each of the habit of mind ratings at the end of the semester from course satisfaction ratings, while controlling for the corresponding first-week habit of mind ratings. Findings showed that course satisfaction was a significant predictor of responsibility, engagement, and creativity at the end of the semester, while controlling for first-week responsibility, engagement, and creativity ratings, respectively, $p < .001$ for responsibility; $p < .001$ for engagement; $p < .05$ for creativity. In other words, the more participants were satisfied with the course overall, the more responsible, engaged, and creative they felt at the end of the semester in terms of their academic writing, even when controlling for their first-week measure of each of the corresponding habit of mind. Course satisfaction also predicted flexibility and persistence ratings at the end of the semester, while controlling for first-week flexibility and persistence ratings (respectively); however, these associations were just outside the 95% significance level, $p=.06$ for flexibility and $p=.06$ for persistence.

Average Importance Ratings of Habit of Mind as Predictors. A series of regression analyses was conducted in which the average importance ratings of each of the habits of mind from the mid-semester survey were entered as the predictors and the outcome variables were free response word count from the mid-semester survey as well as course satisfaction and habit of mind ratings at the end of the semester. Corresponding first-week habit of mind ratings were controlled for in the analyses. Findings showed that the average importance rating for openness was a significant predictor of openness at the end of the semester, while controlling for first-week openness rating, $p < .05$, such that increase in average importance rating for openness was associated with increase in openness rating at the end of the semester.

Moreover, the average importance rating for engagement was a significant predictor of free response word count for engagement, $p < .01$, such that the more participants believed that engagement is important for achieving their intention, addressing an audience, and communicating in context, the more they wrote about engagement.

Change in Habit of Mind Ratings as Predictors. Habit of mind ratings from the end of the semester were subtracted from the first-week habit of mind ratings to establish a change score for each habit of mind. Regression analysis was used to predict outcome variables from each of the change scores. Findings showed that changes in ratings of responsibility, engagement, and creativity significantly predicted course satisfaction at the end of the semester, $p < .01$ for responsibility; $p < .01$ for engagement; $p < .05$ for creativity, such that increase in each of these habit's ratings from week 1 to the end of the semester was associated with greater course satisfaction.

QUALITATIVE ANALYSIS

Differences in Frequency of Personal Singular Pronoun Usage

A multivariate analysis of variance (MANOVA) was conducted to examine differences in the number of personal singular pronouns used by participants who were guided in their mid-semester survey free responses to write about the habits of mind specifically in terms of achieving intention, addressing audience, and communicating in a context, compared with participants whose free response prompts were open (e.g., "write freely for five minutes about your curiosity in your current work in this course"). The independent variable was the type of free response prompt (guided vs. open) and the dependent variables were the number of personal singular pronouns used in the responses for curiosity, responsibility, openness, creativity, persistence, flexibility, and engagement. Findings showed that the overall MANOVA was significant, indicating that there are differences between the two groups on the number of personal singular pronouns used in the seven written responses, $p < .001$. More specifically, as Figure 14.1 shows below, follow-up analysis of variance (ANOVA) tests indicated that participants whose free response prompt was open used more personal singular pronouns than those did whose free response was guided, and these differences were statistically significant.
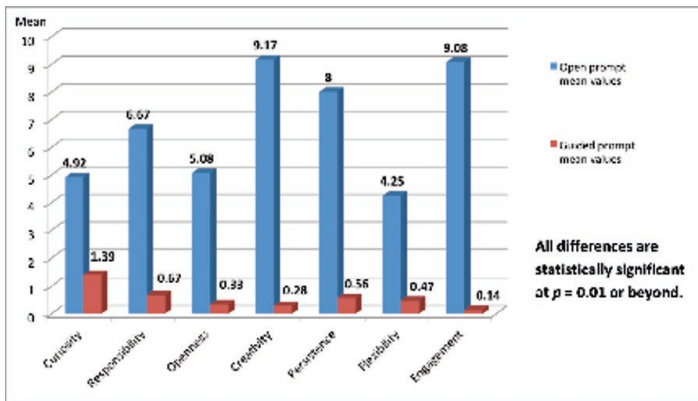

Figure 14.1. Means (i.e., averages) of singular pronouns used in open and guided free response prompts.

Content of Free Response Writing

Each response was coded based on the content of the writing by an individual coder (1 = about the habit of mind in terms of achieving intention, addressing audience, or communicating in context, 2 = about habit of mind in terms of

writing or the course in general, 3 = about the habit of mind in college in general, 4 = about the habit of mind in life, 5 = no mention of the habit of mind). Another coder independently coded the responses for two out of seven habits (flexibility and engagement). Inter-rater agreement was high with Kappa=.85, $p < .001$ for flexibility and Kappa=.94, $p < .001$ for engagement. Only the first coder's coding was used for data analysis, following Rodolfo Mendoza-Denton, Geraldine Downey, Angelina Davis, Valerie Purdie, and Janina Pietrzak's (2002, p. 904) precedent.

A series of ANOVA was conducted to examine whether the content of the writing for each habit of mind predicted course satisfaction at the end of the semester. Only the responses that mentioned the habit of mind were included in the analyses (i.e., response coded 1-4; n=88). Findings showed that content for creativity predicted course satisfaction at the end of the semester, $p=.05$. Follow-up Bonferroni tests showed that there was a marginally significant difference in course satisfaction between those who wrote about habits of mind in terms of writing or course in general, $M=3.31$, $SE=.15$, and those who wrote about habits of mind in life, $M=4.14$, $SE=.3.12$, suggesting that participants who wrote about the habit of mind in life reported higher course satisfaction than those who wrote about the habit of mind in terms of writing or course in general. However, this was just outside the 95% significance level, $p=.06$. Content of writing for other habits of mind did not yield significant results.

DISCUSSION

There are at least three categories for potential considerations of findings from my study of metacognition: research, rhetorical, and pedagogical. The least tenuous seems to be research, namely the call for more of it, given the great need to supplement my modest efforts, and the unfortunately incipient state of empirical research on the *Framework* in general. For example, I would like to see inquiries of any kind connected to why my first-year students' self-efficacy scores did not increase as they did for sophomores, juniors, and seniors, especially since the freshmen indicated higher end-of-semester course satisfaction, which was positively correlated to the test group's self-efficacy scores. This seems pertinent because the *Framework* targets incoming and pre-college students. By contrast, initial self-efficacy in flexibility and engagement predicted no outcomes across all levels in the data I have reported. What might account for the difference? Are these habits less personal or more abstract than the others? Furthermore, why were the habits of responsibility, engagement, and creativity bundled as a trio in my study in several significant findings related to course satisfaction?

Also, what can be made of the notable differences yielded by prompting or

not prompting students to reflect on the habits in terms of rhetorical situation, as seen in Figure 14.1? Although the actual number of personal singular pronouns in subjects' free responses may not be important in itself, the stark difference in quantities registered by "guided" versus "open" responses does seem to be telling. For one thing, if you want FYW students to open up about themselves regarding the habits of mind, as opposed to about the habits more abstractly, then it seems the more open-ended your prompt, the better. But does this hold true over a longer freewriting session? Would the same stark contrast appear in spoken rather than written testimonies? More investigation seems warranted in all of the above areas.

Another reason to conduct research in this area is to make rhetorical uses of one's findings. My study shows that the more students value being engaged in rhetorical situations the more willing they are to write about their engagement. This might seem obvious, but 1) we now have statistically significant evidence that this is so, and 2) this suggests that all metacognition is not the same. Students seem to resist reflecting on unengaging writing tasks and to embrace doing so on engaging ones. So when we look to students' metacognition, say in a portfolio cover letter or on a college application or placement essay, we may not be getting a clear enough picture of what they would say under circumstances of better engagement with their audience, purpose, and context. Another rhetorical use of my findings might acknowledge the strong positive correlation between habits of mind self-efficacy and course satisfaction. Especially convincing is evidence of the predictive power of FYW course satisfaction on responsibility and engagement (both measured at a 99.9% confidence level). This knowledge could inform such administrative concerns as course completion, time to degree, and retention rates. For example, researchers might derive insights into increasing students' course satisfaction, and therefore retention and completion rates, by learning more about and supporting what engages them as academic writers and how they derive and manifest their senses of responsibility.

At this stage we should be wary of definitive pedagogical prescriptions based on these initial empirical investigations, but we can certainly more confidently take next steps in our classrooms and make a point of studying them. For example, my subjects whose initial self-efficacy rating in curiosity was high considered achievement of their intentions in academic writing to be more important than others did; these same students also wrote more about curiosity than others did. So let's explore ways to get students reflecting more and earlier on their curiosity. That could double as a diagnostic step and a potential rhetorical boon, given the correlation between curiosity and achieving one's intention, which is at the heart of most FYW courses. Similarly, my study found initial self-efficacy in creativity to predict the perceived importance of communicating in a

context. With this in mind, anyone responsible for teacher training or shaping curriculum in writing—perhaps especially where habituating high-stakes tests and test prep are concerned—may want to reconsider the effects their programs have on creativity, and the influence that may have on students' perceptions of writing in contexts. College-level writing tends to require close attention to the rhetorical situation, so promoting students' creative approaches to real writing contexts seems an advisable preparatory method to consider in secondary programs, where this practice may not be as prevalent.

As a starting point for any number of future experiments, my study results importantly show that even by means of a very minimal stimulus, focusing students' metacognition on the *Framework*'s habits of mind is likely to increase their self-efficacy as academic writers. Furthermore, SCT tells us that this should increase benefits to students' performance outcomes. Teachers who may wish to adapt my methods for their future instructional purposes can obviously increase the frequency and intensity of the metacognitive treatment as they see fit to do. They can also change the nature of the treatment, for example, from rating scales and free responses to discussions or small writing assignments. Whatever they do, I hope these innovators will report on their adaptations and thereby continue to advance our metacognition about metacognition.

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