Accounting Students' Planning, Writing, and Performance on a Time-Constrained Case Analysis: Effects of Self-Talk and Prior Achievement*

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ABSTRACT

When writing a case analysis, most students first allocate time to plan the content and structure of their response, and then proceed to write with differing degrees of urgency, the outcomes of which are case responses of differing quality. This study examines the extent to which planning time influences writing urgency and, ultimately, the quality of case responses in a time-constrained setting. It also investigates whether these behaviors and outcomes depend on students' frame of mind, by experimentally inducing differing types of pre-examination self-talk. Analyses show that planning time was negatively associated with writing urgency; students who spent more time planning subsequently wrote with *less* urgency. Writing urgency was positively associated with case response quality and, after controlling for differences in writing urgency, planning time was positively associated with response quality. Results indicate that different planning and writing behaviors can be induced by different forms of self-talk prior to the writing task. Relative to interrogative self-talk ("*Will I* . . .?"), exclamatory self-talk ("*I will* . . .!") caused higher-achieving students to spend more time planning, but then write with less urgency and subsequently produce lower-quality case responses. Conversely, after engaging in exclamatory rather than interrogative self-talk, lower-achieving students spent less time planning but then wrote with greater urgency and produced higher-quality responses. These results indicate that (i) planning significantly affects writing and performance, (ii) students can influence their own planning behavior through pre-task self-talk, but (iii) pre-task self-talk can be beneficial or detrimental depending on students' prior achievement.

Keywords Case analysis; Writing urgency; Self-talk; Emotion regulation

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PLANIFICATION, RÉDACTION ET PERFORMANCE DES ÉTUDIANTS EN COMPTABILITÉ DANS UNE ÉTUDE DE CAS DE DURÉE LIMITÉE

RÉSUMÉ

Lorsqu'ils rédigent une étude de cas, la plupart des étudiants accordent d'abord du temps à la planification du contenu et de la structure de leur réponse et procèdent ensuite à la rédaction avec différents degrés d'urgence, ce qui fait que la qualité des réponses varie. Les auteurs étudient la mesure dans laquelle la planification du temps influe sur l'urgence de rédiger et, en définitive, sur la qualité des réponses lorsque la durée de l'exercice est limitée. Ils vérifient également si ces comportements et ces résultats dépendent de l'état d'esprit des étudiants en procédant à une expérience dans le cadre de laquelle les étudiants sont invités à se livrer à différents types de monologues intérieurs préalablement à l'examen. L'analyse des résultats de cette expérience montre que le temps de planification est en relation négative avec l'urgence de rédiger ; les étudiants qui consacrent davantage de temps à la planification rédigent par la suite avec *moins* d'urgence. L'urgence de rédiger est en relation positive avec la qualité de la réponse et, une fois contrôlées les différences dans l'urgence de rédiger, le temps de planification présente un lien positif avec la qualité de la réponse. Les résultats de l'expérience révèlent que différentes formes de monologue intérieur préalablement à la tâche de rédaction peuvent favoriser des comportements de planification et de rédaction différents. Par rapport au monologue interrogatif (« Vais-je… ? »), le monologue exclamatif (« Je vais… ! ») pousse les étudiants les mieux notés à consacrer davantage de temps à la planification mais à rédiger ensuite avec moins d'urgence, ce qui fait que la qualité de leurs réponses est plus faible. Inversement, après s'être livrés à un monologue exclamatif plutôt qu'interrogatif, les étudiants moins bien notés consacrent moins de temps à la planification mais rédigent ensuite avec une plus grande urgence et produisent des réponses de qualité supérieure. Ces observations indiquent que i) la planification a une incidence significative sur la rédaction et la performance, ii) les étudiants peuvent influencer leur propre comportement de planification grâce à un monologue intérieur préalable à l'exécution de la tâche, mais iii) le monologue intérieur préalable à l'exécution de la tâche peut être bénéfique ou préjudiciable selon le succès passé des étudiants.

Mots clés : Étude de cas, Maîtrise des émotions, Monologue intérieur, Urgence de rédiger

INTRODUCTION

Accounting cases have become a common pedagogical tool in undergraduate and professional programs (Weinstein, 2005; Wilkerson, 2010) because they are believed to help students develop communication, analytical thinking, and problem-solving skills (Lawson, Blocher, Brewer, Cokins, Sorensen, Stout, Sundem, Wolcott, and Wouters, 2014). CPA Canada, for example, employs cases throughout its professional education program and in its Common Final Examination. The popularity of cases in academe also stems, in part, from the support of

published teaching notes that provide case-specific implementation guidance (Howard and Stout, 2006). This guidance for instructors is additionally supported by empirical studies that offer advice on accounting case use (e.g., Stout, 1996; Boyce, Williams, Kelly, and Yee, 2001; Doran, Healy, McCutcheon, and O'Callaghan, 2011). By contrast, relatively little published research gives advice for students preparing analyses of accounting cases. The main goal of the current study is to provide evidence on one key aspect of case analysis: to what extent does spending time planning a case response impact the quality of that response, in a time-constrained setting?

We study the effects of planning time on case response quality in a time-constrained setting for two reasons. First, time constraints are common in most undergraduate and professional settings, whether self-imposed by students or externally imposed by others. Externally imposed time constraints are particularly common in professional accounting exams; CPA Canada's Common Final Examination assesses students' technical and enabling competencies with cases that must be written within periods ranging from one to five hours. Second, whereas the impact of planning time on case response quality in unconstrained settings seems obvious —the more planning time the better—the impact is less apparent in time-constrained settings. On the one hand, students who spend more time planning have greater opportunities to identify and better organize relevant case information. However, by allocating more time to planning, these students sacrifice the time available for writing a response. Without empirical research on the relationship between planning, writing, and performance, instructors are left to offer advice based on intuition without realizing that subtle underlying relationships could render that advice inappropriate. A controlled, time-constrained setting is needed to better understand the possible tension between students' planning and case-writing behavior.

A second purpose of this study is to determine whether students' frame of mind affect their decisions about the time to allocate to planning their written case responses. Drawing on research in psychology, we examine the possibility that different types of pre-task self-talk will lead students to allocate more or less time to planning their written case responses. Self-talk is inaudible discussion that students use to "get up" for a test, similar to how athletes "psych up" for sporting events (Tod, Iredale, McGuigan, Strange, and Gill, 2005), or to calm down, just as high-anxiety patients convince themselves to relax during clinical counseling (Prins and Hanewald, 1999). By inducing these ups and downs, self-talk has the potential to help students focus on the demands of impending academic tasks (Collins, Dansereau, Garland, Holley, and McDonald, 1981). Business executives report using self-talk in workplaces to regulate their emotions and produce better quality outcomes (Rogelberg et al., 2013), so we are curious to discover whether this brief intervention affects student behavior and performance.

To investigate the relationships among planning, writing, and performance and the extent to which students' frame of mind influence planning decisions,

we conducted an experiment in which graduate accounting students completed a time-constrained, in-class case analysis. We found that planning decisions were associated with writing behavior and case response quality, but these associations were not merely simple positive relationships. Rather, planning time was negatively associated with writing urgency; students who devoted more time to planning proceeded to write their response with *less* urgency, despite having less remaining time for writing. Writing urgency was then positively associated with case response quality. We examined the impact of self-talk on planning and writing by inducing students to write 10 statements that either exclaimed ("*I will ….!*") or questioned ("*Will I ….?*") how they would plan and write their case responses. Results indicated this intervention created significant differences in how students planned for and wrote their case responses, and ultimately led to significant differences in the scores earned on the case. Specifically, when higher-achieving students exclaimed rather than questioned their test-taking strategy, they spent more time planning their response but then wrote with less urgency and earned lower case scores. By contrast, when lower-achieving students exclaimed rather than questioned their test-taking strategy, they spent less time planning but then wrote with greater urgency and earned higher case scores. Taken together, the results demonstrate that (i) planning significantly affects writing and performance, (ii) students can influence their own planning behavior through pre-task self-talk, but (iii) whether pre-task self-talk is beneficial or detrimental depends on students' prior course achievement.

DEVELOPMENT OF HYPOTHESES

Task Analysis

Based on our prior experience in using accounting cases in time-constrained settings, we identify two crucial stages to a case analysis. In the first stage (planning), students read the case with the goal of identifying relevant information on which they will base their analyses and reports. During this stage, they highlight information, make margin notes, and organize the information into topics, issues, or themes to later use as an outline to guide their writing. The work completed during the planning stage does not directly impact the scores awarded for the case analyses because the case notes and outlines are not assessed. However, many regard the planning stage a crucial part of case analysis (Switzer, 2012) because it directs the work in the second stage (writing). During the writing stage, students present relevant case facts and implications, as identified and organized during the planning stage. For students who spend little time in initial planning, the writing stage involves embellishing and reshaping ideas that may have been superficially considered during planning. For other students who thoroughly plan their response, the writing stage involves merely executing the plan because the main creative and constructive work already occurred during planning. Ultimately, however, the quality of the case analysis is assessed using the written response so student

behavior during the writing stage is likely to directly affect performance scores on case analyses.[1]

Effects on Planning

The thoughts and attitudes with which accounting students approach academic tasks have been shown to influence their behaviors and task-related outcomes (Backof, Bamber, and Carpenter, 2016; Bloch, Brewer, and Stout, 2012; Ravenscroft, Waymire, and West, 2012). Some of these thoughts and attitudes, such as their ranging beliefs about the fixed or malleable nature of intelligence (Dweck, 2006), are developed and reinforced over long periods. Other momentary frames of mind can be induced with minimal intervention (Wyer and Xu, 2010), but yield significant consequences influencing whether people construe tasks in abstract or concrete terms, focus on implementing versus deliberating decisions, and emphasize long-term or short-term outcomes. Because our goal is to understand whether students can influence their own planning behavior through pre-task self-talk, we draw on the literature involving shorter-term frames of mind (Wyer and Xu, 2010).

A significant body of empirical research shows that subtle changes in the way people think about a situation can dramatically change the way they approach it. For example, explaining *why* leads people to focus on high-level, abstract features whereas explaining *how* leads them to focus on low-level, concrete features (Trope and Liberman, 2010). Accounting researchers have used this finding to heighten auditor skepticism when evaluating management motives (Backof et al., 2016; Rasso, 2015) and actions (Backof, Carpenter, and Thayer, 2016). Research also has shown that subtle changes in verb tense, such as switching from past tense ("*I arrived*") to present tense ("*I arrive*") or imperfective form ("*I was arriving*"), increases the tendency to perceive events as ongoing (Madden and Zwaan, 2003) and to use the past to form future behavioral intentions (Carrera, Muñoz, Caballero, Fernández, and Albarracín, 2012). Likewise, consumers are more psychologically empowered and better able to resist temptations and distractions when they frame a refusal using terms that suggest stable, internal dispositions ("*I don't* . . .") rather than transitory, situational influences ("*I can't* . . .") (Patrick and Hagtvedt, 2012).

1. Researchers in education and exposition depict undergraduate essay-writing similarly, as a multistage process involving planning, drafting, and revising (Butcher and Kintsch, 2001; Hayes and Flower, 1986; Torrance, Thomas, and Robinson, 2000). In unconstrained settings, these stages involve considerably more recursive and iterative processing (Hayes, 1996), and encompass many subtasks in planning (setting goals, generating ideas, organizing ideas), drafting (translating ideas into language, paraphrasing, reorganizing), and revising (reviewing, evaluating, editing) (Graham and Sandmel, 2011). In time-constrained settings, such as the context for our study, relatively little time is devoted to revising; the primary processes are planning and writing.

Of particular relevance to the current study is prior research that induces people to engage in self-talk by considering decisions in interrogative form. Godin, Bélanger-Gravel, Vézina-Im, Amireault, and Bilodeau (2012) show that people who indicate exercise intentions in response to questions in the interrogative form ("*Will I try …?*", "*Do I have the intention …?*") later exercise more than people who indicate their intentions in response to statements expressed in declarative form ("*I will try …*", "*I intend …*"). Senay, Albarracín, and Noguchi (2010) theorized that the interrogative form elicits personal reflection, so it is more likely to influence behavioral intentions and drive actual behavior than declarative self-talk. Consistent with this rationale, Senay et al. (2010) empirically showed that interrogative self-talk induced higher levels of intrinsic motivation, which in turn led to greater exercise intention. They also showed that interrogative self-talk, even occurring as part of an unrelated task, led to greater achievement on subsequent tasks than declarative self-talk. In the context of our study, if interrogative self-talk promotes self-reflection, this effect should be evident in the time spent planning a case response.

In comparison to interrogative self-talk (e.g., "*Will I …?*"), prior research has not yet examined the effects of exclamatory self-talk (e.g., "*I will …!*") on academic performance.[2] We anticipate exclamatory self-talk will influence students by heightening emotions similar to the effects of "psyching up" before an athletic performance. In the context of the present study, the effect of exclamatory self-talk also should be evident in students' case response planning.

The extant literature has documented that the impact of motivational strategies can be moderated by other factors. Specifically, research in education has shown that prior student achievement moderates the influence of emotion regulation on task performance (Schwinger, Steinmayr, and Spinath, 2009). Accordingly, consistent with the education literature, we expect the effects of self-talk on planning will depend on the level of prior academic performance. The precise pattern of such an interaction, however, is difficult to specify. We speculate that higher-achieving students naturally engage in greater personal reflection and tend to be relatively calm prior to exams, so they would be less (more) sensitive to the

2. To explore whether students engage in self-talk, a survey was conducted with 4th year undergraduate students at a large public university. The survey was designed to determine whether students actively attempt to influence their emotional state for course assessments. Of the 52 responding students (representing a 100 percent completion rate), 94 percent (i.e., 49 respondents) indicated that they believe emotional states impact exam performance. Nearly 20 percent (i.e., 10 respondents) indicated that they try to "psych up" immediately before an exam to increase their state of arousal whereas 67 percent (i.e., 35 respondents) indicated they try to "calm down" immediately before an exam to decrease their state of arousal. Moreover, 40 percent (54 percent) of students that try to "psych up" ("calm down") prior to an exam use self-talk as a strategy. Accordingly, given our context and the number of participants available, we made an experimental design choice to focus on the use of exclamatory and interrogative self-talk as a means of psyching up and calming down, rather than a neutral declarative form of self-talk which did not appear to readily apply to our accounting education context.

effects of interrogative (exclamatory) self-talk than lower-achieving students. However, because empirical evidence supporting such speculation does not presently exist, we summarize the expected interaction only in general terms, as follows:

HYPOTHESIS 1. *The type of self-talk will interact with level of prior student achievement to influence planning time during time-constrained case analysis.*

Effects on Writing

As more time is used in planning, less time remains for writing in a time-constrained setting. One possible response to less available time is that students write with greater urgency, taking shorter pauses when writing and producing more words per minute of writing (Epting, Gallena, Hicks, Palmer, and Weisberg, 2013). Students also may write more efficiently because the time spent planning allows them to become more fluent in thinking and translating ideas into language (Ellis and Yuan, 2004). On the other hand, greater planning time could lead students to feel greater confidence in their ability to successfully complete the writing stage. If students become overconfident as a result of spending more time planning their written response, they could write with less urgency. In light of these competing predictions, the following null hypothesis is proposed:

HYPOTHESIS 2. *The time allocated to planning during a time-constrained case analysis will not be associated with the urgency with which students write their case responses.*

Effects on Performance

Prior research has shown that text quality is positively associated with time allocated to planning and writing (e.g., Butcher and Kintsch, 2001; Hayes and Flower, 1986). Greater planning time allows students to think more broadly and deeply about topics (Ellis and Yuan, 2004), and a sense of urgency when writing promotes the translation of ideas into text (Connelly, Dockrell, and Barnett, 2005). Although greater planning time could lead to less urgent writing, as discussed earlier for H2, planning time is expected to be positively associated with the quality of the written product after controlling for differences in writing urgency. The following hypothesis presents this expected relationship:

HYPOTHESIS 3. *Performance on a time-constrained case analysis will be positively associated with writing urgency and, after controlling for writing urgency, with time allocated to planning the written case response.*

METHOD

Participants and Materials

Of 87 students (40 male, 47 female) enrolled in an auditing course in a Master of Professional Accounting program at a large public university, 86 were present in class to individually prepare a written response to a time-constrained case scenario. Following procedures approved by our university's research ethics board, students were given the option to voluntarily participate in the study in exchange for instructor feedback on the case. All students in attendance voluntarily participated in the study. Students appeared highly motivated to complete the case analysis, perhaps because other assessments in the course and Master's program involved time-constrained cases. Students represented a large cross-section of accounting programs, having completed an undergraduate accounting degree at one of 23 different universities. At the time of the study, the students had been permanently employed in public accounting for an average of 7.8 months.

The case materials were selected from a prior professional accounting exam (Canadian Institute of Chartered Accountants (CICA), 2006), but modified to remove topics that did not pertain to the course. The modified case materials comprised narrative text only (no financial statements or tables). The case scenario described a franchiser evaluating a point-of-sale accounting system for possible purchase. Students were required by the case to prepare a report that evaluated a proposal provided by the franchiser's information services provider. The case information included many issues for students to consider for their report, including the system's cost, timing of implementation, and design, as well as the service provider's experience with point-of-sale systems and the process used for soliciting proposals. Students were expected to identify multiple issues, explain their implications, and propose possible resolutions.[3]

Procedures

At the beginning of class, students were advised they would be given 45 minutes to read and write their response to a case scenario. They were told that a hard copy of the case would be distributed and students would prepare their written responses using their laptops. Students were advised that 45 minutes was the total time to plan and write their responses. Later, they would be given time to transmit their responses to the course instructor. They were asked to record the time at which they had completed each of the planning and writing stages of their case analysis.

Prior to distributing the case, the instructor informed students that prior research had shown that students could improve performance on tasks by getting

3. A single-subject, rather than integrative case, was used in the course because it best fit the course objectives.

into an appropriate frame of mind. To help them with this, they were provided a randomly chosen piece of paper that contained one of two statements and they were instructed to type the sentence 10 times prior to beginning the case analysis. Students in an *interrogative* condition typed "Will I plan and then write?" and students in an *exclamatory* condition typed "I will plan and then write!" Although brief, this intervention is consistent with manipulations of self-talk in prior studies (e.g., Senay et al., 2010). Compliance with the self-talk task was verified later by examining the electronic files submitted by students. After all students had completed the randomly assigned self-talk task, the case was distributed to students. Immediately after 45 minutes had elapsed, students entered the current time, and saved and closed their files. Students then transmitted their files to the course instructor using the course management system.[4]

Design

Independent Variables

Participants were randomly assigned to either an *interrogative* or *exclamatory* self-talk condition, using the procedures described above. Six of these participants (3 *interrogative*, 3 *exclamatory*) noted that their approach to case analysis involved continuously iterating between planning and writing, so they were unable to indicate the time at which their activities switched from planning to writing stages. These missing data points led to excluding these six participants from the analyses, leaving 40 participants in each of the *interrogative* and *exclamatory* self-talk conditions.[5]

Higher- and lower-achieving students were identified using a multiple-choice test administered approximately one week prior to the in-class case analysis. Other measures of prior achievement, such as grade point average, were not obtained because the students represented 23 different undergraduate programs that used different grading scales. Use of the multiple-choice test allowed us to identify relative achievement levels across all students, prior to their involvement in the experiment. Questions for the multiple-choice test were selected from prior professional accounting exams. The multiple-choice test scores were positively correlated with

4. We chose to randomly assign students to self-talk conditions, rather than allow self-selection of their customary type of self-talk, to prevent an unmeasured variable (correlated with a self-selected type of self-talk) from being an alternative explanation for the effects of self-talk. The downside to this experimental design of randomly assigning, rather than allowing self-selection of, self-talk type is that some students were likely assigned a type of self-talk that matched their typical self-talk, whereas others were likely assigned a type that did not match their typical self-talk. Because assignment to conditions was random, we would expect an equal number of matches and mismatches across experimental conditions, which would create no bias in tests of hypotheses but could introduce noise into the data, which would decrease the likelihood of finding support for H1.
5. The average case scores for the six excluded participants and the 80 remaining participants did not differ at a statistically significant level ($F = 0.445$, $p = 0.507$).

final course grades ($r = 0.22$, $p = 0.019$), suggesting their validity as an achievement measure at the time of the study. To facilitate reporting results, we created two groups (*higher-achieving* [$n = 37$] and *lower-achieving* [$n = 43$]) by splitting at the median multiple-choice score.[6]

Dependent Variables

Planning time was computed as the number of minutes that elapsed between the start and end of the planning stage, as self-reported by participants. Consistent with Epting et al. (2013), *writing urgency* was operationalized as words per minute, computed as the number of words written (determined using the word count function in Microsoft Word) divided by the number of minutes spent in the writing stage (determined using the start and end of the writing stage, as self-reported by participants). *Case performance* was determined by scoring the case responses. Prior to scoring the case responses, the 10 self-talk sentences and writing stage times were removed from each file. These preparations allowed the course instructor to score case responses without knowing the condition to which participants had been randomly assigned. Two scores were computed for each student. First, the instructor followed the case evaluation guide, which had been prepared by the board of evaluators for the professional accounting exam, to categorize each response using competency-based indicators. Specifically, the breadth and depth of each participant's evaluation of the point-of-sale system proposal was evaluated to categorize responses as highly competent (4), competent (3), reaching competent (2), nominally competent (1), or not addressed (0). Second, using a point-based scoring rubric, the instructor counted the number of relevant observations in each case response that identified the relevant issues, their implications, and their possible resolutions (maximum = 21). Because point-based scoring involved merely counting the number of relevant points made, it required comparatively little judgment; competency-based scoring, which required assessing the breadth and depth of analysis, involved significantly more judgment. Despite these differences, the point-based and competency-based scores were highly correlated ($r = 0.77$, $p < 0.001$). Consequently, only the point-based scores are reported in the following section but the results do not differ substantively when the competency-based scores are substituted for the point-based scores.[7]

6. Students who obtained the median score were assigned to the higher-achieving group, but results do not change substantively if they were assigned to the lower-achieving group. Further, given the possibility that dichotomizing a continuous independent variable could yield statistical irregularities (Fitzsimons, 2008; Irwin and McClelland, 2001), we also examined the interaction between prior test score and self-talk condition, using a continuous, rather than categorical, measure. Results of these analyses are consistent with the median split analyses reported in the body of the paper.
7. The high correlation between point-based and competency-based scores indicated that a second coder was not required. Also, we recognized that because the initial scoring was conducted without knowledge of the condition to which participants had been assigned, any scoring errors would contribute only noise but no bias in the data.

RESULTS

Table 1, panel A reports descriptive statistics for planning time, writing urgency, and case scores, for the four groups, and Table 1, panel B reports correlations among the dependent measures. The means appear to vary across the conditions, which is confirmed by the analysis of variance (ANOVA) test reported in Table 1, panel C and discussed below.[8]

TABLE 1
Descriptive statistics, correlations, and analysis of variance

Panel A: Average (standard deviation) descriptive statistics by experimental group

Condition/dependent measure	Planning time	Writing urgency	Case performance
Higher-achieving/exclamatory [n = 19]	18.6 (4.6)	39.1 (18.6)	8.9 (2.2)
Higher-achieving/interrogative [n = 18]	17.1 (2.9)	44.9 (19.1)	10.2 (3.5)
Lower-achieving/exclamatory [n = 21]	17.0 (3.4)	41.3 (18.1)	10.0 (2.6)
Lower-achieving/interrogative [n = 22]	19.1 (3.3)	33.5 (11.2)	8.5 (3.4)

Panel B: Bivariate Pearson correlations

Variables	Planning time	Writing urgency	Case performance
Planning time	1		
Writing urgency	−0.692 (p < 0.001)	1	
Case performance	0.012 (p = 0.917)	0.239 (p = 0.033)	1

Panel C: ANOVA with planning time as the dependent measure (test of H1)

Source	Type III SS	df	MS	F-value	p-value
Self-talk condition	1.617	1	1.617	0.125	0.725
Prior achievement	0.602	1	0.602	0.046	0.830
Self-talk×prior achievement	64.802	1	64.802	4.995	0.028

Notes:

Planning time is measured using self-reported minutes spent planning, writing urgency is measured using the number of words written per minute during the writing stage, and case performance is measured using the number of points scored on the case. Self-talk condition is the randomly assigned experimental condition of interrogative or exclamatory self-talk, and prior achievement is the participant's prior achievement on a multiple-choice exam split at the median.

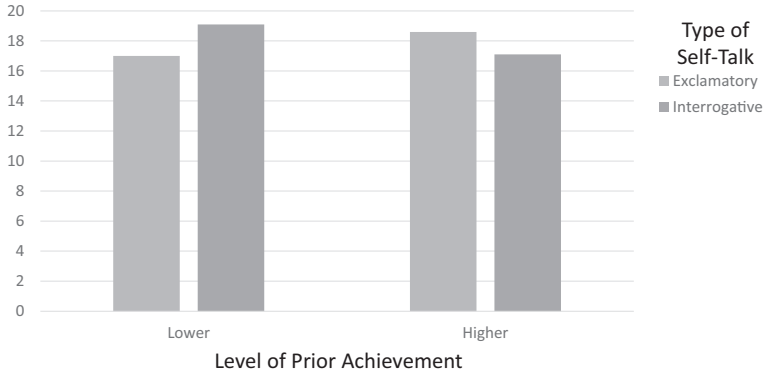
8. Levene's test indicates that ANOVA can be appropriately used because the null that the data are drawn from equal distributions is not rejected, for any of the three measures (largest F = 1.697, p = 0.175).

H1 is tested by comparing planning time in each condition. As suggested by Figure 1, more time was allocated to planning when *higher-achieving* students engaged in *exclamatory* self-talk (18.6 minutes) rather than *interrogative* self-talk (17.1 minutes) and when *lower-achieving* students engaged in *interrogative* self-talk (19.0 minutes) rather than *exclamatory* self-talk (17.0 minutes). Consistent with H1, the ANOVA reported in Table 1, panel C confirms the statistical significance of the interaction between self-talk and prior achievement ($F = 5.00$, $p = 0.028$).[9]

H2 is tested by regressing writing urgency on planning time. Untabulated results indicate that time spent planning was negatively associated with writing urgency ($\beta = -0.692$, $t = -8.458$, $p < 0.001$). These results suggest that after spending more time in the planning stage, students reduced the urgency with which they wrote, possibly because they became overconfident in their ability to complete the writing task. Such overconfidence has been observed among accounting students in other settings (Chui, Martin, and Pike, 2013). Reported in Table 2, further regression analyses showed that the significant negative relationship between planning time and writing urgency persisted ($\beta = -0.674$, $t = -8.286$, $p < 0.001$) after including in the model the type of self-talk ($\beta = -0.291$, $t = -1.527$, $p = 0.131$), prior achievement ($\beta = 0.022$, $t = 0.218$, $p = 0.828$), and the interaction between self-talk and prior achievement groups ($\beta = 0.329$, $t = 1.662$, $p = 0.101$).

H3 is tested by regressing case performance on writing urgency and planning time. Untabulated results indicate case performance was positively associated with writing urgency ($\beta = 0.474$, $t = 3.199$, $p = 0.001$) and planning time ($\beta = 0.340$,

FIGURE 1 H1 interactive effects of self-talk and prior achievement on case planning time



9. Simple effect contrasts indicate that, for lower-achieving students, exclamatory self-talk led to less planning time than interrogative self-talk ($F = 3.621$, one-tailed $p = 0.030$) whereas for higher-achieving students, exclamatory self-talk led to slightly more planning time than interrogative self-talk ($F = 1.647$, one-tailed $p = 0.101$). When grouped by self-talk, prior achievement level was significant for interrogative self-talk ($F = 2.991$, one-tailed $p = 0.044$) and marginally significant for exclamatory self-talk ($F = 2.047$, one-tailed $p = 0.079$).

TABLE 2
Regression with writing urgency as the dependent measure (test of H2)

Source	β	t-value	p-value	VIF
Planning time	−0.674	−8.286	<0.001	1.015
Controls				
Self-talk condition	−0.291	−1.527	0.131	5.583
Prior achievement	0.022	0.218	0.828	1.528
Self-talk×prior achievement	0.329	1.662	0.101	6.016

Notes:

Tabulated p-values are two-tailed, and all variance inflation factors (VIFs) are less than common metrics suggestive of multicollinearity (O'Brien, 2007).

$t = 2.293$, $p = 0.013$). These results indicate, consistent with H3, students earned higher case scores when they spent more time planning and wrote with greater urgency. Reported in Table 3, further regression analyses showed that, after including in the model the type of self-talk ($\beta = -0.326$, $t = -1.258$, $p = 0.212$), prior achievement ($\beta = -0.096$, $t = -0.721$, $p = 0.473$), and the interaction between self-talk and prior achievement groups ($\beta = 0.333$, $t = 1.235$, $p = 0.221$), case performance continued to be positively associated with writing urgency ($\beta = 0.438$, $t = 2.837$, $p = 0.003$) and planning time ($\beta = 0.331$, $t = 2.200$, $p < 0.016$). Finally, an untabulated regression of case performance on planning time alone found no significant association ($\beta = 0.012$, $t = 0.105$, $p = 0.460$). Taken together, the analyses indicate greater writing urgency was associated with better case performance, and more planning time had a positive impact on case performance after controlling for writing urgency, which was negatively associated with planning time.[10] These results are summarized in the path model shown in Figure 2.

DISCUSSION

Summary and Contributions

The primary focus of this research was on the relationships among accounting students' planning, writing, and performance on time-constrained case analyses. As

10. To corroborate this observation, we ran a bootstrap analysis to analyze whether planning time has an indirect effect on case performance through writing urgency. The analysis yields 95 percent confidence interval limits of −0.457 to −0.101 which are statistically significantly different from zero, using 5,000 bootstrap samples (Sobel test value = −0.271, SE = 0.091, $Z = -2.974$, $p = 0.003$). The bootstrap analysis results continue to hold when controlling for self-talk condition and level of prior achievement. This analysis demonstrates that planning time has an indirect effect on case performance through writing urgency, without requiring a direct significant association between planning time and case performance (Hayes, 2009). See Hayes (2013) for further details on analyzing indirect effects via bootstrapping.

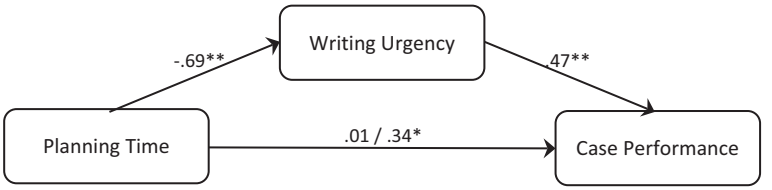
TABLE 3
Regression with case performance as the dependent measure (test of H3)

Source	β	t-value	p-value	VIF
Writing urgency	0.438	2.837	0.006	2.044
Planning time	0.331	2.200	0.031	1.944
Controls				
Self-talk condition	−0.326	−1.258	0.212	5.757
Prior achievement	−0.096	−0.721	0.473	1.529
Self-talk × prior achievement	0.333	1.235	0.221	6.238

Notes:

Tabulated p-values are two-tailed, and all variance inflation factors (VIFs) are less than common metrics suggestive of multicollinearity (O'Brien, 2007).

FIGURE 2 Path model associations among planning time, writing urgency, and case performance



Notes:

Planning time is not directly associated with case performance ($\beta = 0.01$, $p > 0.05$), but it is positively associated with case performance after controlling for the positive association between writing urgency and case performance ($\beta = 0.34$, $p < 0.05$). Numbers represent standardized betas. *$p < 0.05$, **$p < 0.01$.

expected, results indicated that students earned higher case scores when they wrote with greater urgency and after spending more time planning. The analyses led to the discovery that writing urgency was negatively associated with planning time: the more time students spent planning their responses, the less urgently they proceeded to write their analyses. This negative association between writing urgency and planning time has two potential explanations. One possibility is that students struggled to detect the case issues and therefore spent more time trying to uncover them during planning and then subsequently wrote with less urgency because they again struggled to explain the issues. This explanation is ruled out however by the finding that planning time was in fact positively associated with case scores, after controlling for writing urgency. The second and more likely possibility is that students who spent more time planning developed a feeling of overconfidence after having discovered the main issues in the case (Chui et al., 2013), which led them to subsequently write with complacency rather than urgency. Thus, one contribution of

the current study is that it reveals that the relationships among planning, writing, and performance are not as obvious as one might expect. Although greater planning helps students identify and organize pertinent thoughts, it also can negatively impact case performance if it leads students to write with less urgency, as it did in this study. Accordingly, the study's results highlight a practical implication instructors can share with students: no student should "relax" after planning a case response; in a time-constrained case analysis, both higher- and lower-achieving students can increase their case performance by increasing the urgency with which they write.

The second goal of this study was to determine whether students could influence their planning time through a short burst of self-talk. Self-talk did have significant effects on the time students allocated to planning, as hypothesized. These effects varied systematically depending on the type of self-talk and on students' prior course achievement. Relative to interrogative self-talk ("*Will I* . . .?"), exclamatory self-talk ("*I will* . . .!") led students who had experienced recent success on a test to spend more time planning whereas it yielded the opposite effect for lower-achieving students, who spent less time planning. We explain this crossover pattern with the theory that exclamatory self-talk heightens students' emotions, which for higher-achieving students produces a feeling of confidence in their case analysis approach and for lower-achieving students yields a feeling of anxiety and urgency to begin the writing stage of the case analysis. Thus, a second contribution of this study is one of caution for students and instructors: self-talk exerts significant effects on initial case planning but whether those effects will be beneficial or detrimental depends on the type of self-talk and students' prior course experiences. Unlike sports, where most athletes benefit from "psyching up" for an impending task (Tod, Hardy, and Oliver, 2011), no one type of self-talk is best for all students conducting case analyses. In particular, this study documents that a mismatch between motivational self-talk and prior course achievement occurs when exclamatory self-talk is used by lower-achieving students and interrogative self-talk is used by higher-achieving students which results in an impediment to apply the planning-based case analysis approach.

Limitations

These contributions are qualified by some limitations, which provide direction for future research. First, the experimental design included two types of self-talk but it did not include a control condition. Consequently, we cannot attribute the observed differences between the exclamatory and interrogative self-talk to one particular type of self-talk. Nonetheless, our design was adequate to show that students could use self-talk to influence different planning behaviors. Second, we used the strength of the experimental method to manipulate types of self-talk rather than passively measure students' frames of mind. Future research that manipulates *and* measures the thoughts and attitudes elicited by self-talk can pinpoint particular mechanisms (e.g., anxiety, overconfidence) by which self-talk influences student behavior and performance. A promising possibility for future research is studying

whether students can use self-talk to reframe pre-exam anxiety as positive excitement rather than negative stress (Brooks, 2014; Crum, Salovey, and Achor, 2013). Finally, this study involved only one group of graduate students analyzing one single-subject accounting case in a time-constrained setting. Whether these findings extend to less experienced students completing integrative cases without significant time constraints is not yet known. Future research that systematically varies learner and task characteristics may reveal new relationships among planning, writing behavior, and performance, and may discover new situations in which the effectiveness of self-talk depends on interactions between learner and task characteristics. Sports psychologists have predicted instructional self-talk is most effective for novices completing detailed tasks whereas motivational self-talk is most effective for experts completing higher-level tasks, but empirical research has not yet supported this prediction (Theodorakis, Weinberg, Natsis, Douma, and Kazakas, 2000). Accounting may be an ideal domain for testing this prediction because accounting professionals differentially allocate attention to mechanical versus conceptual tasks depending on whether they are novices or experts (Ramsay, 1994).

CONCLUSION

People can spend countless hours preparing for events, the success of which is judged based on brief moments of performance. Professional advisors may spend months gathering and evaluating information to deliver in a two-minute pitch to prospective clients. Similarly, students can spend weeks preparing for a time-constrained task, on which their performance can be influenced by seemingly minor alterations in their frame of mind immediately prior to the task. This study highlights the significant influence of this brief period on subsequent behavior and performance, focusing on students' planning and writing in a case-based examination. But this focus represents only one of many possible situations to be considered. We encourage accounting education researchers to identify other ways that a pre-task frame of mind and in-task behavior influence student performance, taking into account not only the momentary mindsets that exist immediately prior to a task but also those that have been developed through a lifetime of experience (Dweck, 2006; Bloch et al., 2012; Ravenscroft et al., 2012).

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