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Cognitive Demands and the EFL Writer: Observations on Kind, Degree, and Agency

[Exigencias cognitivas y el escritor de inglés como lengua extranjera: Observaciones sobre tipo, nivel, y autonomía]

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Abstract

Research into understanding the process through which EFL writers revise texts have centered on matters of degree: of cognitive capacity and complexity or volume of tasks. This essay explores some of the junctures between dual process theories and EFL composition, and argues that questions of kind can be as pertinent. It aims to show that the kind of cognitive processes involved in revision often define what information the writers process, how they do so, and how they feel about their decisions.

Keywords: dual process theories, EFL composition, process theory, revision

Resumen

Investigaciones que buscan comprender el proceso mediante el cual los escritores EFL enfocan la revisión de sus textos en cuestiones de grado: de capacidad cognitiva y complejidad o volumen de tareas. Este ensayo explora algunos de los nexos entre *dual process theories* y composición en EFL para argumentar qué tipo de temas pueden ser de igual pertinencia. Su objetivo es demostrar que el tipo de procesos cognitivos relacionados con la etapa de revisión, con frecuencia, definen qué tipo de información se procesa, de qué manera se hace, y posteriormente, cómo se siente el escritor frente a sus decisiones.

Palabras clave: teoría de proceso dual, proceso de redacción, redacción en inglés como lengua extranjera

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Half or more of the grammatical and coherence problems in my students' texts result from my students' inability to detect their mistakes rather than their inability to correct them. They are knowledgeable of the rules and conventions but are unable to see where they should be applied during the revision stage of composition. Once a mistake is pointed out, even by pointing to the phrase or space where a word may be missing, my students are quick to recognize and correct that mistake.[1] The question then is: Why were they unable to see what was needed? Research into the composition process offers a variety of answers though most of them fall under the category of degree. This category covers two areas: the number of tasks that the writer is engaged in and the writer's cognitive capacity (how many tasks the writer's mind can field at any one time) (see, Kellogg, 1988 and Rijlaarsdam, & Van den Bergh, 2008).

My students and I have benefited from this type of research. It has helped us train our sights on simplifying complex tasks into more manageable subtasks and persuaded us to be more mindful of our cognitive load before and during the revision process. Still, I have been unable to shake the sense that there remained something beyond the conscious control of my students when they revised.[2] I was not fully convinced that they had both absolute knowledge and agency over the tasks and processes, and subsequently, that success was to be achieved by increasing the level of capacity awareness and task simplification.

It is important that we help students identify the situational and contextual causes of revision, and I have come to believe that student writers are often wholly unaware of some of the cognitive processes involved (Connor & Farmer, 1990). Identifying these cases is crucial because of the role that they play in defining the information processed during revision, how it is processed, and how the writer feels about those decisions. These cognitive processes are the subjects of recent breakthroughs in the subfield of dual systems theory of cognitive psychology. I will explain some of the relationships between them and EFL composition in this paper.

I would like to identify some of the limitations of the writer's agency over the writing process and to show that questions of kind can be more important than questions of degree. Questions of degree refer to those that have, up to now, been the object of research into the cognitive processes involved in composition (as I will show); questions about the number of tasks involved or the degree of computational ability that the student has. Questions of kind refer to those that we should begin to explore, those that could serve as a useful complement to the research already in place; questions about the type of cognitive processes involved and consequently about whether the writer can be aware of them as they function.

To do this, I first provide a brief overview of the perspectives from which EFL composition has been studied and how, in the field of revision, interest has tacked toward questions of degree. Subsequently, I propose that we reconsider the level of agency that has been traditionally awarded to the student writer, and I then go on to show how dual process theory allows us to incorporate questions of kind into our discipline. I conclude with some observations on how this can be helpful to the writing teacher and call for further research in this area.

Although there is ample research into the teaching of L2 composition, see for example: Kroll, 1990, Johns, 1986, Jones, & Tetroe, 1987, Liebman-Kleine, 1986, Reid, 1989, Spack, 1984, and Zamel, 1976, I make no distinction between teaching L1 and L2 composition in this text in part because ". . . developments in ESL composition

[1] The effectiveness of selective error identification in contemporary structured writing has been shown by Gomez, Parker, Lara-Alecio and Gomez, 1996.

[2] My students are Colombian college students whose English proficiency oscillates between a low B2 and a low C1 on the CEFR scale.

have been influenced by and, to a certain extent, are parallel to the teaching of writing to native speakers of English" (Silva, 1990, p. 11). However, and most importantly, because doing so would presuppose the interest that I hope to kindle. This interest would lead to further exploration of the possibilities of incorporating dual process theory as a complement to the current manner in which the cognitive processes involved in ESL and EFL composition are studied.

Process Writing: Revision

The revision stage is often one of the more challenging steps in the composition process not just for my students but for EFL writers in general (Hillocks, 1986). This step, in what is generally known as Process Writing, is one of four macro levels of composition, each of which in turn, encompasses other micro stages. Both the larger and smaller steps in the process are recursive and subject to modification based on the purpose of the text and/or the level of the writer's proficiency. The writing process has a long history, insofar as EFL pedagogical approaches go and it is generally agreed upon that the writing process method has its roots in the National Writing Project, a form of professional development initiated by James Gray and colleagues at the University of California Berkeley in 1974.[3] The NWP, which fostered the principles of process writing, is today fully integrated into the educational mainstream, is part of the Federal Education Program, and has nearly 200 sites throughout all 50 states (National, 2012). Consequently, the process approach to teaching writing has subsequently emerged as the primary paradigm for teaching composition.

The most important early cognitive model to emerge in the area of process writing was proposed by Hayes and Flower in "A Cognitive Process Theory of Writing". Here, the authors present a model consisting of three major processes: Planning, Translating, and Reviewing. The latter, which can be divided into evaluation and revision, has the power to interrupt the writer's process at any point (Flower-Hayes, 1981). As a result, ". . . a relatively small number of cognitive processes [are] able to account for a diverse set of mental operations during composing." (Graham, 2008, p. 188), and the cognitive approach to composition has elicited substantial attention from researchers in language education, Linguistics, and Psychology. In the last thirty years, the understanding that writing is not just a multi-process activity but one that is dynamic, recursive, and complex has led to growing interest into the cognitive processes involved in composition and revision. Researchers in this field have sought to achieve a more complete understanding of the cognitive processes associated with review, which would, in turn, have a significant effect on the sense of proficiency felt by student writers and on the quality of the texts produced. The observations presented here follow in this tradition.

Thus far however, the pursuit of this understanding has followed a general tendency toward measuring the number of tasks and the cognitive capacity for processing them, that is, it has focused on questions of degree rather than kind. An example of this can be found in the studies that explore the processing demands of writing (for example, see Torrence and Galbraith, 2008). Studies of this kind depart from the premise that limited cognitive capacity, both in our long and short term memories, is the primary reason for ineffective composition and revision (see, Kellogg, 1996, & 2001). Other researchers have also looked into the possibility of disruption of verbal short term memory and efficient memory management (see, Olive & Piolat, 2002). These approaches, again, begin from the presupposition of limited processing capacity, and true though this may be, it is not the sole, nor the first obstacle that writers face. In these studies, it is the number of tasks that the writer can process at one time, or to use an analogy, the number of bites that the writer's brain has within it, wherein lie the principal cognitive challenges to the production of effective texts.

[3] Some have even sought to trace its tenets back to the classical models of rhetorical instruction (e.g., Bloodgood, 2002)

I would like to propose that challenges exist not solely in the order of degree but of kind, and subsequently, the kind of cognitive processes involved ultimately lead us to question the writer's degree of agency. Because the processes described in this paper often function beyond the writer's awareness, it can be said that he may not have the level of autonomy attributed to him by cognitive process theorists.

The concept of an autonomous writer can be traced back to the time of Flower and Hayes' article, and has been adopted by researchers who have followed their path of inquiry: researchers who depart from the premise that the writer is aware of the judgments and decisions made during composition and revision. Flower and Hayes speak of ". . . the distinctive thinking processes which writers orchestrate and organize . . ." (Flowers & Hayes, 1981, p. 366). Almost thirty years later, Torrance and Galbraith displace the writer's autonomy to their "writing system" but remain in awe of the autonomy's prowess and agency. They state that "The fact that [we are] writing this at all . . . is a testament to the writing system's ability to coordinate and schedule a number of different processes . . ." (Torrance & Galbraith, 2008, p.67).

Detection and Correction

We should reconsider the assumption that the writer is an active participant in the cognitive processes of revision. Twenty-five years after his landmark essay, Hayes (2004) suggests as much in "What Triggers Revision?". Hayes (2004) points to the possibility of there being an alternate, aside from capacity and management, factor behind ineffective revision when he says that "more attention [is needed] to methods for teaching writers the judgmental skills needed to detect problems in texts . . ." (p. 17). He describes the process of revision as having two steps, detection and correction, and of the former he notes that the skills that novice writers have are insufficient. Consequently, because these writers are insensitive to identifying problems in their texts and ". . . because there is a major gap in our knowledge of how to teach revision" (Hayes, 2004, p. 17), it is difficult, (or impossible) to teach them to correct those errors that they cannot see.

The advances made by cognitive psychologists in the areas of decision making and reasoning can help us to better understand why students lack these detection skills. We can begin by examining our associative systems, those intuitive and automatic connections that our minds make without our being aware of them.[4] By doing this, we may better our chances of identifying the obstacles to student writers seeing their mistakes.

I should point out that dual system theorists differentiate between the intuitive and associative and the deliberate and reasoning aspects of our minds. In this text, I will limit myself to citing the dual process theory espoused by Daniel Kahneman. My intention in doing this is to provide tentative explanations as to why students fail to detect errors in their texts and also, why their failure to detect precedes their attempts to correct them.

The cognitive processing model defined by Kahneman (2011) provides important insights into the manner in which we perceive and process information that we intend to evaluate or assess. The model gives us a novel perspective into our attitudes about these structures, and how these attitudes inform and affect what we focus on, ignore, and decide. All of this, of course, is indispensable knowledge to a teacher of composition who tries to identify explanations that account for why students fail to detect their mistakes.

[4] Some of the roots of associative activation can be found in David Hume's *An Enquiry Concerning Human and Understanding* (1748) where he charts the principles of association as, resemblance, contiguity (in time and space), and causality.

Revision and Dual Process Theory

Kahneman's theory is founded on the idea that we have an innate and resilient inability to recognize our poor capacity for objective evaluation. We are bad at detecting our mistakes because our associative systems make decisions intuitively and without deliberation. We ignore our ignorance and overvalue our judgment. DPT identifies the source of our mistakes, which helps us reallocate our efforts to avoid them. It explains that the sources of the mistakes in the revision process are only partially dependent on language and are mostly the result of the innate manner in which we perceive and process information, that is, dependent on the kind of cognitive processes involved.

Dual process theory describes our cognitive system as divided into system 1 (S1) and system 2 (S2). Each of these systems has distinct characteristics and functions. The former, in more common situations, is likely to influence the latter without S2 being aware of this influence. S1 is the more intuitive and it ". . . operates automatically and quickly . . . with little or no effort, and no sense of voluntary control" (Kahneman, 2011, p.110) while S2 is more deliberate and is governed by logic and reasoning. S1 tells us that one object is farther than another while S2 helps us find the product of an equation where four or more numbers are involved such as 17 x 39. S1 then, makes quick and sometimes inaccurate decisions based on experience whereas S2 resorts to rational, sequential, and learned processes, which are more deliberate and conscious than others.[5]

Problems surface when we believe that we are using S2 when in fact S1 is doing the work. This occurs during the various stages of revision; one of the many associative systems of S1 makes assessments and judgments under the guise of S2, which has been ostensibly recruited to evaluate the text for purpose, coherence, and overall clarity. Because S1 relies on prior knowledge and experience which is (mostly) subjective, it is not very good at taking the outside view of things, of seeing the text objectively. S1 is good at suppressing ambiguity and evoking ideas and information that are compatible with the current state of things. Therefore, a coherent argument in the writer's mind may not be affected by incoherent paragraphs on the paper (Kahneman, 2011, p. 252).

All of the information that we receive is first assessed by S1, which then determines whether extra effort is needed from S2. S1's methods are associative in nature, and because it favors coherence and ease of recall over accuracy, if S2 is consulted, it is an active coherence seeking S1 that will suggest solutions to an understanding S2 (Kahneman, 2011, p. 109). In the suggestions that it proposes, it will link a sense of cognitive ease to illusions of truth and pleasant feelings. It will function under reduced vigilance, neglect ambiguity, and suppress doubt because its bias is always to believe and to confirm. It does this by focusing on existing evidence and ignoring absent evidence (Kahneman, 2011, p 117). The function of the emotional coherence that S1 seeks is that it makes it easier for us to anticipate, recognize and understand our environment in everyday life.

The following are among the fallacies that S1's associative systems are responsible for, and that interfere with the revision process:

Cognitive ease.

S1 selectively responds only to that input that ensures cognitive ease. Cognitive ease can be generated by input that is: (a) repeated experience, (b) composed of things that feel familiar, (c) information that is presented in a clear display, (d) information that feels true, (e) ideas that have been primed (in the writing process, priming can occur through the instructions and objectives that accompany assignments, model texts, and through

[5] Rene Descartes was the first modern thinker to envision a mind partitioned into controlled and automatic centers.

the various drafts that are part of the process), (f) information whose processing feels effortless. Throughout this process, S2 will only be recruited if S1 is unable to render a judgment or provide suggestions. Often, S1 has a judgment to render and S2 does not participate in the process. When reviewing a text, a section of a text, the structure of an argument, or the relevance of a particular idea, S1 is subject to confirm rather than question if any of the above input (a–f) is present. In its search for coherence, S1 will judge the matter under review as acceptable or valid without ever engaging S2 so that it can examine, deliberate, and provide a reasoned analysis of the matter and its relevance or value. Once S1 renders its verdict acceptable or valid, S2 does not question the decision but feels as if that decision was one that it took.

Halo effect.

The halo effect is a common example of how the search for cognitive ease leads to unexamined decisions and a high level of confidence in them without concerted deliberation It is most easily recognized in the world of politics and celebrities where we allow first impressions to dominate, and subsequent information is ignored to conserve emotional coherence.[6] This same tendency will lead S1 to do one of three things: (a) privilege the argument as it exists in the mind of the writer over what appears on the paper. (b) Suppress ambiguity on the paper or (c) interpret the ambiguity so that it is coherent, either with what has been written or with what is on the writer's mind (Kahneman, 2011, p. 87). In doing so, S1's search for cognitive ease comes at the expense of the demands of the task or the needs of the intended audience.

It is easy to see how all of this can prove problematic when trying to achieve an objective valuation of the content and structure of a text. S1's tendency to suppress or ignore ambiguity will be reinforced if the input appears coherent, as it will to the mind that wrote it. It will also be reinforced if it generates cognitive ease, which will certainly be felt by the mind that is seeing the same sentences for a second or fifth time. S1 will be unlikely to identify errors in the text because ". . . words that you have seen before become easier to see again" (Kahneman, 2011, p.63) and they generate a sense of cognitive ease that leads to reduced vigilance. Kahneman tells us that S1's ". . . search for information and arguments is mostly constrained to information that is consistent with existing beliefs, not with an intention to examine them" (2011, p.108).

I have often told students that an important step towards becoming a better writer is the ability to identify your own mistakes. When asked how they might go about doing so, I have given the unhelpful answer, "try looking at your paper as if someone else had written it". This has helped less often than I would have liked and more often than it should. A more useful answer to their question and to how to go about mitigating the impact of the halo effect is to de-correlate errors. This principle is explained in James Surowiecki's book *The Wisdom of Crowds,* where he shows that where individuals judge poorly, groups of individuals are very effective. The concept behind this is that independent and multiple sources of evidence are useful in delivering an accurate and objective evaluation. This is precisely what we do when we ask our students to engage in peer revision and what the editors of this journal rely on in order to receive an objective and accurate evaluation of the merits of articles submitted; the independent, anonymous, a multi-person, peer review process.[7]

Substitution.

Substitution is a self-explanatory phenomenon whose impact can be widely felt. George Polya, in How to Solve It makes a comprehensive case

[6] An exaggerated faith in small samples and a misallocation of causation where only correlation is present are other ways in which the halo effect functions.

[7] "The purpose of this book" Kahneman tells us, "is that it is easier to recognize other people's mistakes than our own." (p.27). For more on the benefits of peer review see Mendonca & Johnson, 1994.

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for the usefulness of heuristics (substitution) in answering problems or making decisions where information is limited.[8] One example of substitution that he presents is replacing a difficult question with a simpler one. However, there are several risks in this type of substitution when they are adopted without S2 being involved. One of the examples that Kahneman gives to illustrate these risks is an investment officer at a financial firm who, when it comes time to decide whether to invest millions of dollars in Ford stock, substitutes the question "is the stock underpriced?" With the easier and possibly catastrophic "do I like Ford cars?".

This same process of S1 functioning through the use of heuristics or intuitive substitution can find its way into the revising process where, faced with difficult questions such as: Is this text coherent? Does it accomplish its purpose? Is this the best phrasing for this idea? Instead, the writer intuitively, and without knowing that substitution has taken place, answers questions like: Do I understand this text? Do I like this text? or How do I feel about this text? By answering the last two questions, the writer may come to a decision, but does so emotionally and irrationally.

Affect heuristic.

The way that we feel about something is quite often the dominant consideration when making decisions. This is one of the conclusions of Paul Slovic's Affect Heuristic; where peoples' decisions are generally influenced by what they like and dislike (Slovic, Finucane, Peters, & Mac Gregor, 2002). A second characteristic of the Affect Heuristic is the dominance of conclusions over arguments. Thus, in S1's process of evaluation, the conclusion that states that this is a persuasive essay against mandatory seatbelt laws will supersede and override the quality of the arguments that preceded it. Because S1 is active and coherence seeking while S2 is passive and undemanding, S2 will generally examine the validity or relevance of the arguments presented but limit itself to reaching a conclusion that is consistent with previous information or beliefs. If he is informed by S1 that what is concluded is familiar, understandable, and that it pleases him, the writer may be unable to detect, or even suspect, that the text requires changes.

Framing effects.

Framing Effects is a third example of how what we see or how information is presented to us affects how we make decisions. These illustrate the tendency that we have to base our responses on the manner in which information is presented. For example, "90% fat free meat," elicits a different response than "meat with 10% fat." Also, a " .01% chance of a fatal reaction to a medical procedure" is usually more reassuring than hearing that "one person out of 1000 dies as a result of this procedure".

When my students see a block paragraph typed with the first line indented and the left and right margins justified, they assume that because it has the visual properties of a paragraph, it must also have all of the other characteristics that make it a paragraph. Similarly, when they write:

- Introduction
- Body
- Conclusion

they assume that this constitutes most of what an outline should be because it looks like one. If it looks like a duck, it is in all likelihood a duck even if it walks like a greyhound and sounds like a macaque.

Kahneman calls this an instance of *What You See Is All There Is.* This means that the information provided, in this case by a visual

[8] *Heuristic:* a simple procedure to find adequate though often imperfect answers to difficult questions (Kahneman, 2011, p. 103). Polya's heuristics are strategic procedures implemented by an engaged S2 whereas the substitution examples mentioned here are adopted by S1, intuitively and without any evaluation of their consequences.

presentation, suffices for S1 to make a decision without consulting S2; without searching for more information. What we expect to see is commonly what we in fact see (see Chapman & Chapman, 1982).

Anchoring.

One of the most common uses of framing effects is anchoring. Anchoring is the reason why when two parties negotiate a price, the party who presents the first offer is at a slight advantage. The initial amount will affect the counteroffer without the second party necessarily understanding why or to what degree. Daniel Gilbert's reason for this traces back to Spinoza and his thesis that to declare a statement false or to not believe (in) it, we must first understand it as true and that disbelief is a deliberate revision of belief (Gilbert, 1991, p. 108). We must believe a statement to be true, *prior* to rendering a judgment about that statement. Believing is then, automatic and a function of S1 whereas unbelieving is a function of S2.

The Moses Illusion: "How many animals of each kind did Moses take on the Ark?" (Erickson & Mattson, 1981) is a well-known example of anchoring. It is an example of how little attention we pay to the words that we see, and most importantly, it is an elegant example of the level of overconfidence that unexamined beliefs can generate. On the subject of excessive confidence that follows S1 judgments, Kahneman warns us:

> Subjective confidence in a judgment is not reasoned evaluation of the probability that this judgment is correct. Confidence is a feeling, which reflects coherence of the information and the cognitive ease of processing it . . . declarations of high confidence mainly tell you that an individual has constructed a coherent story in his mind, not necessarily that the story is true (p. 220).

Students are as likely to have excessive confidence that "the story is true", as that the paper has a clear purpose and is organized in an effective manner and thus opt out of the central requirement of process writing; that which asks writers to compose multiple drafts because if one is overconfident about what this draft does, no further (re)writing is needed. The amount of evidence and its quality do not account for much, because poor evidence can make a very good story (Kahneman, 2011, p.217). If asked to bet on my answer that two animals of each kind were taken on the ark, I would have wagered a hefty sum, and lost, not knowing what I did not know/see, that Moses took no animals on the ark, but that Noah did. Not knowing what I did not know and being overly confident that I knew/saw all that was there to be known/seen, the coherent story in my mind was not in the least affected by the incoherent statement on the paper. Proof of what Kahneman tells us, that ". . . our comforting conviction that the world [to say nothing of our writing] makes sense rests on a secure foundation: our almost unlimited ability to ignore our ignorance" (p. 208). Whereas not seeing mistakes on paper can pose an obstacle to correcting these mistakes, feeling absolute certainty that there are no mistakes to be found only exacerbates the situation.

Therefore, not seeing, and believing that there is nothing to be seen, are joined by a third problem: our recalcitrance to assimilating evidence that contradicts the second and illuminates the first. One of the more memorable illustrations provided by Kahneman is an anecdote that shows the surprising ineffectiveness that objective, and proven information can have on changing our beliefs. Kahneman computed correlations between the investment outcomes of 25 wealth advisors and their year-end bonuses, two variables that should have had a high degree of correlation; ideally, the best advisors receiving the highest bonuses. He found the correlation to be .01, which surprised him, though not as much as the response of executives and advisors. Both groups were unaffected by the facts. This was a typical case in which personal impressions from experience dwarfed the statistical evidence before them. This case leads us to a question worth considering: How, apart from the empirical evidence present, can students convince themselves that what they see as clear and persuasive on paper may not be so for others?

A story with a similar theme, this one involving psychology students, leads Kahneman to conclude that teaching psychology is ". . . mostly a waste of time" (p. 178). It may well be that students of writing will be equally intractable to assimilating information about how their mind *sees* and deliberates, but it is certainly worth giving it a shot; worth providing them with some of the fascinating insights that cognitive processing and DPT offers.

In Practice

In the classroom, the insights provided by DPT can be helpful to instructors in a variety of ways. I have for some time, albeit unknowingly, tried to counter the effects of framing by having students present the sentences in their paragraphs in bullet form or some other format that encourages them to confront unexpected spaces between ideas. This also allows them to consider the necessary relationships that must reside there—to think about the fact that proximity requires affinity. I have also experimented by presenting tasks and model texts for the same assignment (with different groups) using a variety of presentations to gauge how priming affects the writing process.

Mini-lessons that expose students to the ample statistical evidence available on the decorrelation of errors can serve as a frame to reinvigorate popular activities such as peer review, collective drafting, and anonymous text evaluations by certifying their purpose and validity. While exposing students to the kind of cognitive processes that we engage in, doing so systematically and empirically can help students discover the limits of their autonomy during the writing process and promote the use of new methods of reviewing their texts. This may increase their sense of ownership in the process of discovering how to become better writers and give them a sense of interdisciplinary nature of writing.

As instructors, understanding the writer's cognitive processes can help us step away from the tutorial model of teaching writing (Hayes, 2004, p.17). By helping students discover how they perceive, reason, and feel about their choices of writing rather than by simply telling them what we think about their writing, we may advance student empowerment over the composition process and subsequently their proficiency.

Conclusions

"Why didn't I read that again?" and "Why didn't I see that?" are questions that every writing student has asked themselves and questions to which we have, up to now, provided not entirely satisfying answers. Part of the reason for this seems to be that the questions that we asked ourselves came from the erroneous premise that we can see or understand by using the tools that we have always used. When in fact, as dual process theories shows, the autonomy of writers over what they see and how they process it is very limited and their decisions are seldom the products of a deliberate and rational process.

The work being done in cognitive psychology offers new and promising options toward helping writers to answer those troublesome questions. By incorporating what we have come to learn about how we perceive, decide, and feel about our choices, we can be more useful to our students and help chart fruitful new ground for the field of composition studies. Having said this, it is worth mentioning that this article does not intend to provide a comprehensive description of the links between DPT and the composition process. Instead, it intends to present a case for a shift in how we perceive and teach writing and for further research into an area that has yet to receive the interest that its potential rewards merit.

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