

Antonym and Oppositeness: A Cognitive Training Approach of Thinking in English Writing in the AI Era

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Abstract: Oppositeness is not necessarily identical to antonym, but it imparts wisdom in the teaching of writing, particularly in era of AI. Starting from the “construction of oppositeness” in cognitive realm, this paper explores the foundation of writing with innovative thinking, which aims to cultivate innovative ability and counteract the impact of AI writing. The cognitive recognition of oppositeness in writing encompasses the comprehension and utilization of contrasts, antonyms and conflicting concepts to foster a more dynamic and captivating textual composition. Adopting a reverse mindset (oppositeness) aids in averting monotony in writing while AI-generated content can occasionally become repetitive and monotonous. The cognitive awareness of oppositeness assists in introducing diversity and preventing predictability in writing. By employing oppositeness, one can enhance the reader’s comprehension of novel concepts by establishing intricate connections with familiar ones. As a creative thinking technique in writing, it serves as a potent tool for human writers to uphold their pertinence and distinctiveness amidst the proliferation of AI-generated content. By facilitating the production of unparalleled and authentic material, creative thinking transcends AI’s capacity to replicate such output. While AI can generate content based on preexisting data and patterns, genuine creativity nurtures groundbreaking ideas and perspectives that transcend the limitations of an AI’s dataset.

Keywords: English Writing; Oppositeness; Antonym; Cognitive Awareness; AI Writing

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1. Introduction

The concepts of antonym and oppositeness are of great importance in Writing, as thinking in an opposite manner helps students to be more innovative and critical of established ideas [1,2]. However, this two terms are never identical as wikipedia dictionary holds: antonym is word having a meaning opposite to that of another word, for instance, the word “wet” is an antonym of the word “dry”. In other word, a word opposite in meaning to another: “fast” is an antonym of “slow”. Or a word that means the opposite of another word: “empty” is an antonym of “full”. However, Wikipedia dictionary places more significance on the connotation of oppositeness:

Oppositeness refers to the relation between opposed entities: (1) One that is opposite or contrary to another; (2) An opponent or antagonist; (3) An antonym. To be more precise, the word “opposite” denotes: a. Placed or located directly across from something else or from each other: opposite sides of a building. b. Facing the other way; moving or tending away from each other: opposite directions. c. Being the other of two complementary or mutually exclusive things: the opposite sex; an opposite role to the lead in the play. d. Altogether different, as in nature, quality, or significance: The effect of the medication was opposite to that intended. e. Sharply contrasting; antithetical: had opposite views on the subject 2.

As a cognitive approach in writing, thinking in an opposite manner (antonym and oppositeness) helps students to “ward off the impact of AI writing” [3-5]. Furthermore, plenty of scholars hold that thinking in an opposite manner will not only help us to be



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more critical about the established opinions but enlighten students as a cognitive training approach of thinking in English writing, which is full of the academic and practical significance [1,6,7].

2. The Discrepancy between Antonym and Oppositeness as the Cognitive Training Approach of Thinking in English Writing

Antonyms and oppositeness are related concepts in the realm of linguistics and semantics, which deal with the relationship between words that have contrasting meanings. Antonyms are words that have a directly opposite meaning as mentioned previously [8]. There are several types of antonyms: (1) Gradable Antonyms: these are pairs where there's a spectrum of meaning between the two words, such as "rich" and "poor." (2) Complementary Antonyms: these are pairs where there's no intermediate state, it's either one or the other, such as "single" and "married." (3) Converse Antonyms: these express a reverse relationship between two things, like "buy" and "sell". (4) Relational Antonyms: these are pairs where the relationship is reversed, such as "teacher" and "student." In a word, an antonym refers to a specific type of word relationship where two words have opposite meanings. For example, "hot" and "cold" are antonyms because they represent opposite ends of a temperature scale. Antonyms are a subcategory of the broader concept of oppositeness [8].

Oppositeness is a broader concept that includes antonyms but is not limited to it. While all antonyms are opposites, not all opposites are antonyms [8]. Oppositeness can also encompass other types of semantic contrast, such as: (1) Meronymy vs. Holonymy: the relationship between parts and wholes, e.g., "wheel" is part of a "car". (2) Hyponymy vs. Hypernymy: the relationship between specific and general terms, e.g., "Rose" is a specific type of "flower". In essence, oppositeness is a comprehensive semantic concept that includes various forms of meaning contrast or opposition, which extends beyond mere direct antonyms. This includes not only antonyms but also other contrasting relationships [8].

To enhance the cognitive awareness of students in writing, it is beneficial to cultivate their understanding of antonyms and oppositeness with "critically patterned ideas in writing" [9,10]. Here are some strategies to improve writing skills in this regard: (1) Study Word Relationships: look at how words are used in context and how they relate to other words. (2) Learn Lexical Fields: understand that words are organized into fields or groups that share a common semantic area. (3) Use Dictionaries and Thesauruses: these resources often indicate antonyms and related terms. (4) Practice Identifying Examples: engage with texts and try to identify antonyms and other forms of oppositeness in action. (5) Consider Cultural and Contextual Nuances: realize that antonyms and oppositeness can be influenced by culture and context. By engaging with language actively and considering the various relationships that words can have with one another in writing, students can develop a deeper understanding of antonyms and oppositeness while improve your cognitive awareness in writing skills. A cognitive training approach to enhancing English writing skills is an educational methodology designed to optimize the cognitive processes involved in writing in English, particularly [11,12]. It can also be regarded as an instructional method that specifically targets the development of cognitive processes and strategies involved in the act of writing [13,14]. This approach is firmly grounded in the recognition that writing encompasses not only linguistic activities but also intricate cognitive tasks which necessitates diverse skills and abilities [13,15,16]. In addition, it aims to enhance not only the linguistic aspects of writing but also the underlying cognitive abilities that are crucial for tackling the impact of AI writing in model era [4,5,17].

To be more specific, key aspects of a cognitive training approach in English writing include "Metacognitive Awareness", which entails instructing students on developing a heightened awareness of their cognitive processes during the writing process [18]. It encompasses strategies for planning, monitoring, and evaluating their written work while

concurrently maintaining an opposite awareness. Additionally, it is important to note that opposite awareness does not necessarily equate to antonymic understanding. Thinking in an antonymic and opposite manner can assist students to be more critical in writing and foster a heightened level of criticality in their writing [19], thereby it will cultivate skills in information analysis, argument evaluation and perspective development. This includes the capacity to synthesize data, identify biases and present evidence-based viewpoints. Furthermore, promoting unconventional thinking and fostering original ideation can be achieved through activities that stimulate imagination and facilitate exploration of diverse angles and perspectives [18,20]. What's more, adopting an antonymic and opposite perspective when considering the details in writing can offer benefits in various aspects. Firstly, it assists students in approaching writing as a problem-solving endeavor, wherein they must discern the purpose, target audience, and key concepts before determining the optimal structure and presentation of their thoughts [8]. Secondly, it instructs students to meticulously attend to the intricacies of their writing, including punctuation, spelling, and word choice, while simultaneously maintaining focus on the overarching message. Thirdly, it encourages students to embrace change and revision throughout their progress and in response to feedback. A Cognitive Training approach in English writing is student-centered and focuses on the development of skills that can be applied across various writing tasks and situations. It aims to make students more independent and effective writers by providing them with strategies to approach writing in a thoughtful and strategic manner [8]. Additionally, this approach also emphasizes the importance of practice, feedback, and reflection as essential components of learning and improvement in writing.

3. A Cognitive Approach -- the Construction of Oppositeness in Writing

The cognitive approach to incorporating oppositeness in writing involves a structured and thoughtful method of putting contrast and contradiction into the text to enhance its effectiveness, depth and persuasive power [18]. This approach is not limited to creating simple comparisons, but rather, it is a deeper cognitive process that requires a thorough understanding and organization of concepts, viewpoints and facts. Identifying opposing elements is of paramount significance in writing [20]. It is necessary to identify elements within the text that can form a contrast, such as opinions, facts, concepts, or values [19]. Additionally, understanding both sides should be a prerequisite: each side of the opposition needs to be explored and researched in depth to understand its implications, supporting evidence, and reasons [18]. The structural organization of oppositeness in writing should be well-built [20]. Students should learn to reorganize the contrasting elements into a cohesive framework using techniques such as parallelism, juxtaposition and progression in order to effectively present them in a scholarly manner [18].

Engaging in a dialectical analysis between the opposing factions, students should elucidate their inherent contradictions and intricate interrelationships, as well as the innate connections and developmental laws of phenomena [18]. Drawing upon this fundamental opposition, the writing should present your own perspective or solution that offers an elevated level of cognitive comprehension and synthesis [18]. Constructing oppositeness in writing is both a writing technique and a cognitive process that requires critical and creative thinking. It involves understanding and analyzing before presenting new insights or perspectives. Through this construction, authors can better express their thoughts which increases the depth and persuasion to their writing.

3.1. The Construction of Oppositeness

Most English words exhibit polysemy, wherein they possess multiple meanings and the selection of a specific meaning is contingent upon the contextual framework [8]. Nevertheless, there exist certain exceptional cases where words demonstrate ambiguity. Taking this sentence as an example, "interests should be your primary concern when you are

looking for a job”, the term “interests” in this context encompasses both “the anticipated benefits one may obtain” and “the activities that align with one’s personal preferences”. In this case, the interpretation of the word will be contingent upon its contextual framework. Furthermore, even after establishing a definitive meaning for a word, individuals may still harbor divergent conceptions. The term “kindergarten” is commonly understood as a facility where children are supervised and cared for. However, from the perspective of these young individuals, “kindergarten” represents a space for communication and social interaction.

The determination of a word’s meaning is contingent upon individuals’ comprehension, and the interrelation between words also relies on individuals’ interpretation. Antonyms, for instance, constitute a pivotal linguistic phenomenon that linguists categorize into two distinct types: “a group of words with inherent opposite meanings in a language”, such as “dress/undress” and “tie/untie”; the other is “a set of linguistic units that lack inherent meaning but are comprehended by humans as possessing an opposite semantic value” [8].

For instance, when individuals board an airplane, rice and noodles are presented as two alternative meal options, as depicted in **Figure 1**. When confronted with a choice between the terms “rice” and “noodle”, which initially possessed closely related meanings, they acquire antonymous connotations within the context of selection. This phenomenon highlights the ability of individuals to generate oppositeness from words that were not originally considered opposites. The construction of word meaning or relationship is contingent upon human bodily experiences, which aligns with the semantic perspective of cognitive linguistics.



Figure 1. Noodles or Rice

A crucial approach to cultivating this cognitive awareness lies in mastering opposite thinking, wherein the crux of this cognitive process involves adopting a fresh perspective to identify oppositeness or alternative concepts for words and ideas. In an experimental setting, students were trained to generate as many oppositeness as possible for a conventional bicycle (as depicted in **Figure 2**). Initially, they conceived the notion of a “tandem” bicycle (as illustrated in **Figure 3**), which stemmed from the inventor’s ingenious juxtaposition of “one person” and “two persons”.



Figure 2. An Ordinary Bicycle



Figure 3. A Tandem Bicycle

If students are encouraged to engage in further creative thinking, they can generate more intriguing ideas that go beyond conventional norms. Traditionally, a tandem bike with a boy riding on the front seat and a girl on the back seat is perceived as highly romantic. However, by reversing their positions and having the girl sit in the front seat while the boy sits in the back seat, an entirely novel combination is formed, as depicted in **Figure 4**.



Figure 4. Reversing Their Positions

The design can be further enhanced to achieve the desired objective of unidirectional body movement by placing two seats back to back, with one person riding forward and another riding backward (as depicted in **Figure 5**). This approach of oppositeness (cognitive thinking) not only fosters innovation in product development, but also enables individuals to engage in the exhilarating experience of riding in reverse. Whether it pertains to a single or tandem bicycle, or whether it involves forward or reverse motion, it is imperative to identify the underlying opposite relationship that often goes unnoticed.



Figure 5. Bicycle in Opposite Directions

Similarly, the traditional Chinese virtue story “Sima Guang’s Jar-breaking Incident” exemplifies the application of oppositeness. As depicted in [Figure 6](#), while other children were grappling with how to extract their friends from the Jar (water tank), Sima Guang astutely recognized that making a fissure (by breaking the water tank with a stone) at the bottom of the tank would allow for drainage and ultimately lead to a successful rescue operation. The unity of top and bottom within a cylinder is disrupted by seeking novel perspectives, which serves as the crux of this solution.



Figure 6. The Traditional Chinese Virtue Story

The ability to transform two initially synonymous words into oppositeness (including antonyms etc.) and derive fresh inspiration through the construction of novel anti-sense relationships serves as a pivotal driving force, which enables individuals to consistently generate innovative ideas within the realms of humanities and natural sciences.

3.2. How Do We Start Writing

The human mind possesses a fixed cognitive framework regarding the interrelation of concepts [18]. For instance, individuals commonly perceive “happiness” and “joy” as akin emotions while recognizing “black” and “white” as diametrically opposed ends of the spectrum. Nevertheless, in future academic pursuits, students are highly likely to encounter scenarios necessitating critical analysis, persuasive argumentation and astute application of knowledge for problem-solving. At present, in order to derive novel ideas from original concepts, it is advisable to employ reverse thinking (oppositeness) and adopt a rational approach to transform synonyms into oppositeness or vice versa [18]. This methodology facilitates the identification of distinctive aspects within a pair of analogous notions [8]. Alternatively, it may be discovered that a pair of initially contrasting concepts can exhibit similarities, which fosters innovative ideas and enhancing one's capacity for innovation. Frequently, individuals can employ oppositeness to identify flaws in widely accepted notions. However, what students need to acquire is not the ability to

uncover loopholes in illogical or outdated ideas but rather the mastery of a systematic and logical mode of thinking - creative reverse thinking (oppositeness) [8]. For instance, while conventional wisdom suggests that life and art are distinct domains, the innovation depicted in the image below lies in its dissolution of boundaries between life and art, which results in their complete integration.



Figure 7. Life or Art

The **Figure 7** depicts a girl standing on the beach, with a prominent picture frame positioned in front of her. The juxtaposition of the delicate frame, the silhouette of the girl and the distant sea creates an aesthetically pleasing composition. While photo frames are typically used for displaying photographs or artistic creations, this particular arrangement merges both the physical presence of the girl and the pictorial element to present a genuine work of art. The viewer is left with a sense of awe as they contemplate the beauty of life itself, which requires exceptional creativity to support when writing argumentative essays aimed at demonstrating or refuting a particular point of view [21-23]. Ultimately, in order for Chinese students to excel in future competitions and outperform their international counterparts, they must master innovative thinking methods such as reverse thinking (oppositeness) and cultivate their ability to innovate. This applies not only to science but also to business. Taking the following two texts as exemplars, the utilization of construction of oppositeness can effectively demonstrate “a proficient approach to comprehending writing” [24].

3.3. Case Study

The first text is derived from a discourse delivered by renowned American public speaker Dennis Prager, entitled “The Secret of True Happiness,” wherein he delves into the intricate correlation between the notions of “happiness” and “fun.” Initially, the article presents the widely accepted belief that “happiness is fun”, while the author posits a novel contention that “happiness and fun are mutually independent”. That is to say, the secular idea is that “happiness” and “fun” are two similar concepts (synonyms), but the author treats them as opposing concepts (oppositeness). To further substantiate this argument, the author presents a sub-argument that “happiness is contingent upon our emotional state during events” and “happiness is determined by our emotional state after completing an action”. The author employs two supporting arguments to reinforce this perspective. Firstly, pleasurable activities (fun) such as visiting a park or watching a movie fail to generate lasting happiness since their positive impact diminishes once they conclude. Secondly, beneath the seemingly captivating and glamorous lives of Hollywood celebrities lie various adversities including depression, alcoholism and marital breakdown.

From the analysis above, the author's process of creative thinking becomes apparent. By juxtaposing contrasting concepts such as “happiness” and “fun”, a fresh argument

emerges. Moreover, the author effectively substantiates the contrasting relationship between these initially synonymous terms within a specific context. Moving forward, the author introduces a second sub-point: the frequent intertwining of pain within the sources of our happiness. This aspect is further explored through two compelling arguments. Firstly, assuming responsibility to some extent often entails experiencing pain. For example, an unmarried individual may postpone marriage due to the fear of assuming responsibilities. Secondly, the process of raising children is rife with challenges and hardships; however, it ultimately brings unparalleled joy to parents. Through this study, the author redefines the correlation between "pain" and "happiness", which effectively transforms their original antonymous nature into a synonymous relationship. Hence, it substantiates the notion that "happiness and pain coexist." Ultimately, the author concludes that realizing how pleasurable activities do not inherently yield happiness prompts individuals to lead more purposeful lives. Therefore, this text not only elucidates innovative techniques such as reverse thinking (oppositeness) in constructing antonyms for students but also profoundly influences their perspectives towards learning and life [25,26].

The second text is the American editorial "Shades of Prejudice". At the very beginning, the author presents a widely held belief among Americans that Obama's election victory signifies a departure from racial judgments. However, the author promptly challenges this prevailing notion by asserting that "Americans still make assessments based on skin color". This argument is predicated on the juxtaposition of two contrasting terms, namely "mixed-race individuals" and "black", which are considered antithetical. Originally synonymous with overlapping domains, these two concepts assume contrasting roles within the specific context of the election, which effectively bolsters the author's viewpoint. Within the argumentative discourse, the author takes initiative in presenting a sub-argument that highlights how Obama, being of mixed race and thus categorized as "light-skinned", enjoys a political advantage akin to white candidates over other black contenders. The two arguments employed to substantiate this standpoint are that "skin color, accent and other racial characteristics continue to exert an influence on individuals' prospects", and that "colorism is interconnected with race but not exclusively confined to it". The second argument posits that "individuals of black ethnicity" encounter more impediments in life compared to those who are of mixed black and white heritage.

The author presents two arguments in this article. Firstly, it is observed that black criminals in the United States are twice as likely to receive death sentences for the same crime compared to individuals of "black and white" racial backgrounds. Secondly, during the 2008 election, colorism played a role in providing Obama with an advantage over other black politicians. By contrasting "light skin color (black and white mixed race)" with "dark skin color (black)", the author effectively challenges the prevailing notion that racial discrimination has been eradicated in contemporary society.

4. Conclusion

In contemporary world, many students use ChatGPT to improve their skills and counteract the negative impact of technology [27,28]. While many studies have analyzed the impact of AI on writing, there is little research on understanding cognitive awareness of oppositeness [18]. This approach helps overcome the limitations of AI-generated writing that lacks the subtleties and depth of human-authored content [29]. Using antonyms and contrasting words consciously enhances the richness and vibrancy of descriptions [30,31]. Furthermore, juxtaposing contrasting concepts enhances argument clarity and demonstrates a deep understanding of the subject matter, which help strengthen one's position by acknowledging counterpoint [32]. In storytelling, oppositeness creates tension and intrigue [33]. For example, a character described as "bold yet cowardly" becomes more complex and compelling.

Using a reverse thinking approach (oppositeness) helps writers avoid the monotony often found in AI-generated content [34,35]. Being cognizant of oppositeness brings variety and eliminates predictability in writing [18]. Incorporating antithetical elements helps readers grasp new concepts by connecting them to familiar ones [36]. By consciously incorporating oppositeness into writing, one can generate content that is more nuanced, engaging and distinctly human, which mitigates some of the limitations associated with AI-generated content. However, it is important to acknowledge that AI writing tools are continuously evolving and improving [29]; they can serve as valuable aids in the writing process, particularly for tasks such as generating initial drafts, data-driven reports or rapidly producing content. The key lies in effectively utilizing these tools while synergistically [36] combining their capabilities with the unique perspectives and creativity inherent to human writers [37]. Cognitive awareness of oppositeness, as a form of creative thinking, empowers human writers to maintain their relevance and distinctiveness in the face of AI-generated content. Creative thinking allows for the creation of unique and original material that goes beyond AI's ability to replicate. While AI can generate content based on existing data and patterns, genuine creativity fosters innovative ideas and perspectives that lie beyond the confines of an AI's dataset [27-29]. While AI can serve as a valuable tool for specific writing domains, such as data analysis, technical documentation, or generating preliminary content [27,28], the incorporation of creative thinking in writing is essential to ensure that human writers continue to provide unique value through their capacity to generate inspiration and establish meaningful connections with readers -- an aspect currently beyond the capabilities of AI [38]. By harnessing their creativity, writers are able to produce content that accurately imparts information while captivating audiences on a profound level and showcasing their distinctive human touch.

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