HUMANIZING TECHNICAL COMMUNICATION WITH METAPHOR

by

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ABSTRACT

This thesis explores how metaphors can humanize a technical document and more effectively facilitate user comprehension. The frequent use of metaphor in technical communication reminds us that the discipline is highly creative and rhetorical. Theory demonstrates that a technical text involves interpretation and subjectivity during both its creation by the technical communicator and its application by the user. If employed carefully and skillfully, metaphor can be a powerful tool to ensure users' needs are met during this process.

The primary goal of technical communication is to convey information to an audience as clearly and efficiently as possible. Because of the often complex nature of technical content, users are likely to feel alienated, overwhelmed, or simply uninterested if the information presented seems exceedingly unfamiliar or complicated. If users experience any of these reactions, they are inclined to abandon the document, automatically rendering it unsuccessful. I identify metaphor as a means to curtail such an occurrence. Using examples from a variety of technical communication genres, I illustrate how metaphors can humanize a technical document by establishing a strong link between the document and its users.

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CHAPTER ONE: INTRODUCTION

The *Handbook of Technical Writing* defines a figure of speech as "an imaginative expression that often compares two things that are basically not alike but have at least one thing in common" (Alred 191), further explaining that such a device can "clarify the unfamiliar by relating a new concept with one which readers are familiar" (192). Therefore, a figure of speech forms a bridge of understanding from a specialist to a nonspecialist – a bridge that serves as an essential building block in the framework of effective technical communication. As an additional assistive advantage, "figures of speech can also help translate the abstract into the concrete; in the process of doing so, they can also make writing more colorful and graphic" (192).

Metaphor is one such figure of speech that facilitates comprehension while simultaneously upgrading a technical text's vibrancy and accessibility. This particular device "point[s] out similarities between two things by treating them as though they were the same thing" (Alred 192). The term metaphor comes from the Greek *metapherein*, which means "to transfer." In technical communication, a metaphor transfers understanding of an unknown concept to a reader or user via a known concept.

Furthermore, a metaphor can be categorized as a type of analogy – a figure of speech that is a comparison "[showing] the ways in which two objects or concepts are similar, often used to make one of them easier to understand" (Alred 192). Metaphors employ an arguably efficient and artful shortcut in this process of comparison by simply stating one thing directly *is* or *as* another thing.

In *Metaphor: A Practical Introduction*, Zoltan Kovecses offers a more in-depth analysis of metaphor, beginning with how it functions within everyday language. Specifically, Kovecses considers the way in which life is often described or discussed in terms of a journey, including metaphoric phrases such as "to get a good start," "to get over something," "to go far in life," "to reach the end of the road," "direction in life," and "at a crossroads" (3). The author states that "[English] speakers make extensive use of the domain of journey to think about the highly abstract and elusive concept of life" (4), further explaining that "cognitive linguists suggest that they do so because thinking about the abstract concept of life is facilitated by the more concrete concept of journey" (4).

This notion is especially significant in that if we are naturally inclined to comprehend abstract concepts through accessible domains via "conceptual metaphors," it seems essential to employ this methodology to convey information in technical documents successfully. Even when a technical document's subject is somewhat concrete, it is likely often abstract to a user, since such documents are used primarily to impart information about something that is unfamiliar to the user. In other words, concrete technical content can be so new and unknown to the user that it actually seems abstract. Therefore, Kovecses's explanation of metaphor strongly supports the use of the device in technical communication. The author posits, "If we want to better understand a concept, we are better off using another concept that is more concrete, physical, or tangible than the former for this purpose. Our experiences with the physical world serve as natural and logical foundations for the comprehension of more abstract domains" (6).

George Lackoff and Mark Johnson further reinforce the extensive use of metaphor as a means of understanding in *Metaphors We Live By*. The authors explain that "…metaphor is

pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature" (3). This assertion aligns with that of Kovecses, as it postulates metaphor as an intrinsic part of human thought, life, and reality. Lackoff and Johnson elaborate, "If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor" (3). The authors illustrate how a metaphorical concept translates to everyday activity through the example of the concept of *argument* via the metaphor of *war*, citing such expressions as "Your claims are *indefensible*," "He *attacked every weak point* in my argument," and "I *demolished* his argument" (4).

Lackoff and Johnson posit that this metaphor is not limited to the way we describe *argument* linguistically; rather, "We can actually win or lose arguments. We see the person we are arguing with as an opponent. We attack his positions and defend our own. We gain and lose ground. We plan and use strategies…Many of the things we *do* in arguing are partially structured by the concepts of war" (4). Thus, the process of comprehension and behavior through metaphor is ingrained in our psyche, even in instances in which we are not aware of it. We actually live by metaphors, as Lackoff's and Johnson's title suggests. Tapping into this fundamental means of understanding and operation can empower technical communicators to meet users' needs, since users already employ metaphor in everyday life and have a deep-rooted dependence on metaphor to relate to the world around them.

Purpose

The purpose of this thesis is to explore how the incorporation of metaphors can humanize a technical document and more effectively facilitate user comprehension. The frequent use of metaphor in technical communication reminds us that the discipline is actually creative and rhetorical. A technical text is unavoidably subjective and involves interpretation in both its creation and its application. If employed carefully and skillfully, metaphor can serve as a powerful tool for the technical communicator to ensure the user comprehends the content of a document accurately and efficiently.

In this study, I aim to pinpoint how metaphor functions in technical documents and how the device can be used most effectively. Since metaphor is open to interpretation both during its creation by the technical communicator and during its use by the audience, the technical creator must develop an understanding of how a particular metaphor might be construed by the audience. If the technical communicator can evaluate and apply a metaphor appropriately in a technical document, he or she can enable a user to relate to the text and therefore increase the text's probability of success.

Scope

This thesis explores information from a range of scholarly literature discussing metaphor within the field of technical communication. I examine articles focusing on whether and why metaphor is befitting in the field, as well as the use and effects of the device in technical documents. Specifically, I consider how such metaphors facilitate comprehension of technical content and serve to humanize technical texts, thus making them more usable and accessible for the audience.

The scope of this thesis is limited to consideration of metaphor in technical communication in the categories of *theory of belonging* and *examples of metaphor in technical texts*. Theory of belonging encompasses many scholars' studies of whether and how metaphors fit into technical texts and technical communication as a whole. This discussion is limited to the subcategories of creative technical communication, audience and subjectivity, reader response, and a historical perspective. To supplement and support these scholarly theories, I then outline and examine actual instances of metaphor in a variety of technical documents through analytic journal articles. These examples of metaphor in technical texts include the genres of nature writing and popular science writing, scientific texts, computer documentation, and product documentation, as well as variations of metaphor.

Significance and Rationale

An analysis of metaphor as it functions within the modern field of technical communication cannot be properly conducted without first considering how the field was established and how it has evolved. A number of watershed articles illustrate how scholars in the field paved the way for the acknowledgment and acceptance of metaphor in technical texts by arguing and encouraging the linkage of technical communication with the humanities. These articles are essential to understanding the significance of metaphor within technical communication and how the field has progressed to what it is today.

As a field of study, technical communication has struggled to find its place in the university. In "A Humanistic Rationale for Technical Writing," Carolyn Miller argues that technical communication has humanistic value, stating, "The common opinion that the

undergraduate technical writing course is a 'skills' course with little or no humanistic value is the result of a lingering but pervasive positivist view of science" (610).

Miller's article discounts this positivist view throughout her article, arguing that technical communication is not merely objective and mechanical; rather, it is rhetorical and humanistic. She explains:

> If rhetoric is irrelevant to science, technical and scientific writing become just a series of maneuvers for staying out of the way. A rhetorical discipline built on positivist theory must founder on this self-deprecation at its center. But because there has been no alternative basis for the discipline, technical writing as it is commonly taught is shot through with positivist assumptions, which destroy its aspirations toward disciplinary respectability and relegate it to its status as a skills course. (613)

Therefore, Miller's argument also challenges the hierarchies that were in place within academe, which positioned professors of technical communication below professors of literature. To establish technical communication as a rhetorical practice is to award technical communication courses and professors, as well as the field as a whole, with cultural capital traditionally designated to only the conventional humanities, such as literature.

Miller maintains that although professors and other department staff continued to practice a positivistic theory, many philosophers and scientists had already negated this view. The author explains their primary objections to positivistic theory, including "the complete failure of attempts to devise an observation language, the inability of theoretical terms defined as summaries of known effects to account for new effects observed later, [and] the failure to

account for the growth and itations of logical systems" (615). Essentially, Miller laments that these scholars had begun to move away from the positivist view of technical communication that excludes the perspective of humanism, yet the university had yet to do so.

The true focus of science, according to Miller, is not material things, but rather "human constructions, with symbols and arguments" (616). She posits that "Scientific observation relies on tacit conceptual theories, which may be said to 'argue for' a way of seeing the world. Scientific verification requires the persuasion of an audience that what has been 'observed' is replicable and relevant" (616), and thus, "truth, or the knowledge for which science seeks, is the correspondence of ideas, not to the material world, but to other people's ideas. Certainty is found not in isolated observation of nature or in logical procedure but in the widest agreement with other people. Science is, through and through, a rhetorical endeavor" (616). These observations and arguments strongly support the humanistic value of technical communication – it is, in fact, accomplished and sustained only through *people* and *ideas*.

Miller proposes an alternative approach to technical communication and the instruction of the subject through a "communalist perspective" in lieu of the positivist perspective. In this approach, "the teaching of technical or scientific writing becomes more than the inculcation of a set of skills; it becomes a kind of enculturation" (617). Miller further explains, "We can teach technical or scientific writing…as an understanding of how to belong to a community. To write, to engage in any communication, is to participate in a community" (617). This notion supports a humanistic approach to a technical text as a communication from one person to another, rather than a purely mechanical report of information from an objective non-author to a faceless user.

This humanistic approach is discussed and substantiated in more detail later in the section titled *Audience and Subjectivity*.

Regarding the ways in which technical communication professors can adjust their instructional mindset to complement the rhetorical and humanistic value of the subject, Miller elaborates:

> Our teaching of writing should present mechanical rules and skills against a broader understanding of why and how to adjust or violate the rules, of the social implications of the roles a writer casts for himself or herself and for the reader, and of the ethical repercussions of one's words. We can thus ground our teaching and our discipline in a communal rationality rather than in contextless logic. (617)

The author explains that this rhetorical approach might not obviously or immediately affect the day-to-day instruction of a technical communication course, but the purpose of the approach is greater. She states, "our attitudes might [change], and so might those of our students and colleagues" (617). A change in attitude toward the field as a whole goes far beyond a change in syllabi and instructional methods and materials. This change has far-reaching implications, including the encouragement of technical communicators' creative license, and ultimately enabling and supporting the use of metaphor to improve a technical text.

In "Legitimizing Technical Communication in English Departments: Carolyn Miller's 'Humanistic Rationale for Technical Writing,'" Patrick Moore revisits Miller's article almost 30 years later, and effectively summarizes the three main points of her essay, including 1. "narrow[ing] the perceived distance between technical communication and imaginative literature by showing some of their common ground," 2. "show[ing] how individuals and groups construct

scientific and technological knowledge, a demonstration that resists conventional beliefs that scientific knowledge is objective," and 3. "argu[ing] against some of the conventional scientific beliefs about discourse, and against the political constraints that literature professors place on technical communication faculty in English departments" (168).

Although technical communication as a field of study and its role in the university have evolved, Moore illustrates how many of Miller's assertions still hold true today. He explains that since technical communication struggled, and perhaps continues to struggle, to solidify its place in the university, technical communication professors have been forced to justify their claim to the cultural capital that is typically awarded to traditional humanities. He elaborates, "As a result of that competition, technical communication faculty frequently have had to justify their existence in English departments, and they frequently have had to compete with other academic fields and other professors for students, credibility, and social status" (168).

Moore asserts that literary writings differentiate from plain speech in their complexity and figurativeness, and if technical communications can do the same, they can obtain the same cultural capital (175). This argument is especially relevant in that both of these ends can be accomplished through the means of metaphor, further contributing to its value. The author claims that technical communication professors continue to struggle to earn legitimacy within academe, and that while hierarchies in of some sort in universities cannot be avoided entirely, gaps in capital and status will continue to narrow with the aid of scholarly efforts, such as Miller's and those of her contemporaries.

The inclusion of aspects of literature and creativity in teaching technical communication is not a new occurrence, as Russell Rutter explains in "Poetry, Imagination, and Technical

Writing." In the early and mid-1980s, the number of technical communication courses at universities was dramatically increasing, and thus many teachers who were originally trained in literature were being asked to teach technical communication instead (698). Rutter argues that this shift is not unsuitable or unavailing, explaining, "the insights obtained through advanced literary study are central to the teaching of technical and scientific writing and to demonstrate that recent composition scholarship has shown technical writing to be an imaginative, creative, and thus poetic endeavor" (700).

Rutter explains how the two fields relate, and how literary understanding can contribute to technical communication. He states, "Literary study does not, of course, teach us how to create good poems, but it shows us that people who have created good poems have relied on something more than the transcription of raw data-intuition, imagination, selection, shaping, and so on" (699). This notion can be translated to technical communication as well, as Rutter further cites, "imaginative processes enable scientists and technical specialists to make discoveries and to write about them" (699).

The author expresses the similarities between creating a poem and creating a high-quality, effective technical document. Both involve more than the transcription of raw data; both involve selection, shaping, intuition, and other aspects of creative processes (699). Rutter states, "Designing reports, like designing anything else, is an imaginative act. Teachers who have studied the great authors can at once call to mind the ideas about imagination and the poetic process that reading those authors has given them" (704). He later posits, "If technical writing is not just objective, not just the presentation of facts in proper form, does it not require from its practitioners the creative powers of synthesis and selection that the writing of poetry requires?

The answer is that it does" (707). This assertion establishes a technical communication process that not only allows for aspects of creativity such as metaphor, but actually requires it in order to be successful. Rutter concludes that professors should "free our students from the essentially dead task of piling up facts in the name of objectivity and to help them understand that progress and new knowledge in any discipline result only from the exercise of imagination-from a poetic approach to whatever work is at hand," (709). This poetic approach is essential, he explains, because "Science and technology, insofar as they are human activities, are essentially poetic endeavors because they shape disparate bits of information into truths about the behavior of matter" (709).

Indeed, acceptance and incorporation of creativity such as metaphor in the field of technical communication as a whole begins in the individual classroom, where students are taught how to become effective technical communicators. In Elizabeth Harris's article "In Defense of the Liberal-Arts Approach to Technical Writing," she defends the value of employing concepts and methods typically associated with the liberal arts – "literary theory and history, traditional and modern rhetoric, linguistics, and philosophy and history of science and technology" (628) – in scientific and technical texts. Harris maintains, "we will neglect whole areas of the greatest interest and centrality to scientific, technological, and ordinary workaday writing if we divorce them from the liberal arts" (628).

She further warns against simplifying technical communication and its instruction to "practical writing" with no accompanying liberal arts component of research and consideration, as this practice ignores the complexity of language, the specific situation in which a technical

document is constructed, and the unavoidably subjective experience of constructing it. She argues:

> The value of liberal-arts research in scientific and technological texts generally seems to me to deepen and widen our own understanding of their past and present formal characters, meanings, and functions. We teach all of these matters, under some guise, in the introductory technical writing course. The more we know about them in general, or so it would seem, the better able we are to deal with the concrete, unique situations that arise when we talk to students about their own writing. (636)

The discussion of the function and value metaphor in technical communication is not only significant; it is essential. It contributes to a rich and accomplished history of the discussion of technical communication as it relates to literature and rhetoric, and continues its evolution as a field of study. The more this topic is explored and analyzed, the more effectively technical communicators will be able to incorporate metaphor in support of the humanistic value of technical texts, and, consequently, the more successful those texts will be.

The primary goal of technical communication is to convey information, ideas, or instruction to an audience as clearly and efficiently as possible. However, due to the often-complex nature of technical content, a user is likely to feel alienated, overwhelmed, or simply uninterested if the information presented seems exceedingly unfamiliar or complicated. If a user experiences any of these feelings, he or she would be inclined to abandon the document, automatically rendering it unsuccessful.

Humanization of a technical document through incorporation of textual and visual metaphor can curtail such an occurrence by establishing a link between the document and user through the following process:

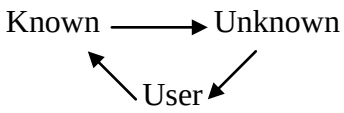

Figure 1: Metaphor's linkage of understanding

Users are presented an idea with which they are familiar and can connect. This *known* idea is connected with the new, likely complicated, *unknown* idea. Thus, the known serves as a bridge between the user and the unknown, allowing the user to grasp the unknown idea. A well-used metaphor can facilitate quick user comprehension, and therefore relieve the technical communicator of much explanatory burden.

Organization

This thesis is organized in the following manner:

Chapter 1, the Introduction, provides an initial overview of the use and value of metaphor as a communication tool, specifically within technical communication. Metaphor is described as a figure of speech that can render a technical text more understandable, relatable, and colorful. The significance of the topic is substantiated through a historical approach that traces some of the evolution of the field of technical communication as it relates to humanism, laying the foundation for the use of creative, literary, and rhetorical elements within technical texts. The thesis's extent of theory of belonging and examples of metaphor and technical texts is

established as the scope of the study, and an outline of the sections and order of the thesis is constructed.

Chapter 2, Theory of Belonging, begins my review of relevant literature that explores theory regarding the relevance and role of metaphor in technical communication. I incorporate a range of opinions and ideas from a variety of scholars in order to develop a well-rounded and thorough study of how metaphor functions in technical documents – specifically how the device allows users to connect with technical documents, thereby increasing their ability to comprehend them and use them successfully. Categories within the discussion of theory of belonging include creative technical communication, audience and subjectivity, reader response, and metaphor and the historical perspective.

Chapter 3, Examples of Metaphor in Technical Texts, identifies methodologies of incorporating visual and textual metaphors into a technical text to effectively connect with users and efficiently facilitate comprehension. In order to determine these methodologies, I examine practical examples of the use of metaphor in technical documents, how they are used and interpreted, and how they affect these documents. Categories within this chapter include metaphor in nature writing and popular science writing, metaphor in scientific texts, metaphor in computer documentation, metaphor in product documentation, and variations of metaphor.

Chapter Four, the Conclusion, summarizes the most important information and key points from the body chapters and discusses opportunities for further research.

Metaphor is a figure of speech that is both an efficient and effective communication tool used to facilitate a user's comprehension of unfamiliar or complex information. In technical texts, an easily understandable metaphor can be used as a bridge of understanding between a

nonspecialist and specialized technical content. The metaphor can thus bear some explanatory burden, making a technical writer's job easier and a technical text more concise and effective.

In Chapter Two, I explore research regarding the place of metaphor within the field of technical communication. This discussion comprises many scholars' ideas and opinions regarding the objectivity versus subjectivity of technical texts, as well as the creative versus scientific, and the compromise and balance of these binaries. Comparisons between technical communication and literature, and technical communication and rhetoric, further enrich the exploration of how metaphor functions in technical texts.

CHAPTER TWO: THEORY OF BELONGING

In order to determine the role and significance of *metaphor* in *technical communication*, definitions of both terms within the scope of this analysis must first be established. Metaphor is a creative textual or visual expression in which one thing or idea is stated directly *is* or *as* another thing or idea. In technical communication, this figure of speech can be employed in order to transfer complex or unknown information to a user via more accessible or easily comprehensible information.

As will be substantiated and discussed more in-depth later in the chapter, metaphor can also be used to make a technical text more vivid and engaging. This outcome is typically not the primary purpose of metaphor in technical communication, as is often the case in traditional literary fields. However, this effect is a valuable by-product of the use of metaphor, in that a text that is colorful and aesthetically appealing is more likely to capture and maintain an audience's interest, thereby increasing the text's likelihood of success.

To pinpoint what "success" of a technical text entails, it is necessary to also specify a working definition of technical communication and its objectives for the purposes of this study. Technical communication can be described through an explanation of communication in general, in that its primary purpose is to impart or exchange information. However, the word "technical" signifies the purpose this specific type of communication, which aims to analyze, explain, interpret, inform, or instruct. In "What's Technical About Technical Writing?" David N. Dobrin conducts analyses on a variety of definitions of technical communication, and establishes a resulting definition: "Technical writing is writing that accommodates technology to the user" (237). The author further distinguishes the following terms in his definition: *writing* as "a way of

thinking and establishing human relations in a group," *accommodate* as "the invasive quality of technology and the self-effacing role technical writing plays," *user* to reflect "the fact that technical writing exists within a system which measures actions, people, and things by the criterion of use," and *technology* as "more than an array of tools or procedures," which "extends to the way human being deploy themselves in the use and production of material goods and services" (237).

Furthermore, "technical" comes from the Greek word *techne*, meaning "art and skill," suggesting that a successful technical communicator analyzes, explains, interprets, informs, or instructs through a text both artfully and skillfully. Metaphor contributes to both art and skill, as it delivers information by establishing a vibrant bridge between a nonspecialist and specialized content.

If metaphor can facilitate the comprehension, acceptance, or use of information artfully, by delighting and even entertaining the audience through accessibility and humanization, the communication arguably has an even greater probability of effectiveness. However, the relevance and value of emotional, subjective qualities such as delight and entertainment within technical communication is not always agreed upon or clearly defined, though such qualities seem to garner acceptance within the field as it continues to evolve.

The purpose of this chapter is to explore scholarly theory regarding whether and how metaphor should be used in technical communication. These theories establish the framework by which metaphor is presented as a device that can both humanize a technical text and facilitate a user's comprehension of technical information. Further, such theory establishes a methodology by which to analyze the examples of metaphor in technical texts in Chapter Three.

Creative Technical Communication

In "Metaphor, Creativity, and Technical Writing," Jerome Bump laments the fact that most technical communication textbooks either omit entirely or even warn against the use of metaphor in technical texts, suggesting this attitude might be a result of the "traditional association of metaphor with emotion" (444). To support his claim, Bump cites the 10th-century *On the Sublime*, in which Longinus associates metaphor with strong emotion in summary of what the sublime encompasses, including "great thoughts, strong emotions, certain figures of thought and speech, noble diction, and dignified word arrangement" (Leitch 136).

However, Bump goes on to point out that Longinus "recommend[s] metaphor in description as well, choosing as his example what we would now call technical writing: the anatomical description of the human body" (452). This early example is noteworthy in its acknowledgement of metaphor's multiple uses and results – subjective, personal connection and objective transmission of information – that do not necessarily conflict, and can actually coexist even within a single metaphor to strengthen a text.

Bump elaborates this idea, claiming, "This more personal, emotional approach to science is apparently more conducive both to metaphor and to other manifestations of the revolt against dualism which the fusing process of metaphor epitomizes, such as 'both/and' thinking and interdisciplinary thought" (445). The both/and method of thought employed through metaphor can be extended to technical communication as a discipline altogether, in that it need not be entirely constricted to designation as *either* subjective *or* objective, nor *either* creative *or* systematic, as these concepts are not mutually exclusive.

Indeed, technical communication is both subjective and objective, both creative and systematic. As Bump explains further, “Instead of taking literally the simplistic partition of a subject into ‘either’ the first ‘or’ the second of two categories, creative breakthroughs are often achieved by perceiving that in reality the subject consists of ‘both’ the first ‘and’ the second parts” (445). By not imposing limits of either/or categorizations, the technical communicator fortifies a text through the freedom to pursue a variety of creative techniques to most effectively meet the needs – and even the wants – of the user.

Further attesting to the role of metaphor in technical communication, Bump asserts that the subjects of many technical documents are founded in creativity, whether new ideas, discoveries, or information; therefore, it seems appropriate that writings on those subjects retain certain aspects of creativity as well. Bump references many scientists and engineers who employ metaphor in their writings, including George Wald, Charles Darwin, Garrett Hardin, John Smeaton, and others (444-446). The author states, however, that these writers “are not using metaphor naively or unscientifically,” rather, “they are objectively aware of the limits as well as the powers of their metaphors” (446). Such limits and powers will be discussed more in-depth in the next chapter through analysis of practical examples of metaphor in technical texts.

In the years since the publication of Bump’s article, technical communication has continued to develop and evolve, with its primary focus shifting from the content of a document to the actual user of the document. This shift entails a progression from the strictly objective (systematic content) to the acceptably subjective (dynamic audience). As a result, an audience should not be simply a vague vision of the technical communicator, but actual individuals who need the information being presented and need to know how to use it or apply it effectively.

Audience and Subjectivity

The recognition of the value of user-focused technical communication is certainly significant to the discussion of metaphor, in that it not only enables the possibility for subjectivity, but actually encourages it. In fact, in "Rhetoric of Science: Enriching the Discipline," Jeanne Fahnestock laments that metaphor seems to be the only rhetorical or creative device that has already aggressively been adopted and accepted in the scientific realm, and that in order for science writing to be more successful as a persuasive enterprise, there is a need to incorporate more flexible stylistics and an appreciation of the role of visualization in scientific argument (277).

What is most significant for the purposes of the current analysis, however, is that a stronger emphasis on the subjective audience and the acknowledgement of a text as the means to transfer information from technical communicator to user is a primary argument for and enabler of the use of metaphor in technical communication.

In order to create a document that is usable and effective, it is imperative that the technical communicator bear in mind the document's context and audience, which arguably go hand-in-hand. An audience derives meaning through the interpretation of a text, and audiences have different needs and contexts that must be considered in order for the interpreted meaning to parallel the technical communicator's intended meaning. If the communicator is misguided or heedless in regard to audience, his or her goal will not likely be met, even if the information itself is valuable and high quality.

As Robert R. Johnson states in "Audience Involved," "The very nature of technical communication begs for conceptions of audience because technical writers are fundamentally

charged with the responsibility of translating information from one context to another" (92). The context of the technical communicator is one of pre-established understanding of the subject at hand, whereas the initial context of the audience is characterized by a lack of knowledge or understanding, of which the extent varies. Thus, the primary goal of technical communication is to facilitate the audience's understanding, and this can only be achieved if the communicator identifies important attributes of the audience and conveys the information accordingly. Such attributes might include whether audience members are technical or non-technical, what information they lack, and their educational background.

Audience-focused principles of effective technical communication were employed long before they were formally examined and accepted. In "Chaucer's A Treatise on the Astrolabe: A 600-Year-Old Model for Humanizing Technical Documents," Peter J. Hagner and Ronald J. Nelson use the work of Geoffrey Chaucer, who is considered one of the earliest published technical writers in English, as a guide for modern technical communicators in learning how to humanize a work and focus on the user. These goals are accomplished by bridging the gap between writers and readers and balancing objectivity with subjectivity. The authors state, "People all too often forget that writing, in whatever form, is from one human being to another" (87).

Reader Response

Although reader-response theory as a whole offers analyses of how readers interact with and shape literary texts, some critics' examinations, such as those of Wolfgang Iser in "The Reading Process: A Phenomenological Approach" and Peter Rabinowitz's in "Before Reading," can be effectively applied to the field of technical communication as well, and can help explain

how metaphor functions in technical documents. The incorporation of literary theory into the discussion of metaphor in technical communication is appropriate, considering the historical perspective of metaphor, and also offers a more well-rounded analysis and additional means to explore the role and response of the audience.

As established, metaphor serves several purposes in technical communication, including humanization of texts and facilitation of understanding of new and complex ideas – both of which tie into reader-response theory. Although Iser's discussion of the reading process focuses on literary texts, his ideas can be effectively applied to technical communication as well – in both contrast and comparison – in order to understand the function of metaphor in such documents. Contrary to literary works, as Iser discusses, the goal of technical communication is a single interpretation, but the process of arriving at that interpretation must be bearable and engaging in order for a technical document to be successful. In this way, Iser's ideas about reader response and the reading process connect to the role of metaphor in technical communication.

Iser claims, "the more a text individualizes or confirms an expectation it has initially aroused, the more aware we become of its didactic purpose, so that at best we can only accept or reject the thesis forced upon us. More often than not, the very clarity of such texts will make us want to free ourselves from their clutches" (1004). Of course, technical documents and literary texts are read for different purposes, and clarity and fulfillment of expectations are considered actual goals of technical communication rather than overly simplistic and undesirable practices. However, the notion of the unappealing nature of an indifferent, unyielding, or uninteresting text applies to technical communication as well. If a technical document does not actively engage the

reader in some way, the reader will not be as attentive and will likely miss or misunderstand information, or even abandon the document due to lack of interest or frustration.

Metaphor is an effective way to captivate a reader's attention for several reasons. By way of Chaucer, Hagner and Nelson advise, "By integrating the human voice into their writing, technical writers (1) establish a rapport with readers, (2) engage readers into the content of the document, and (3) facilitate readers' comprehension. As a result, the chances of the document's achieving its purpose(s) are significantly improved" (87). The focus, therefore, is not merely on the objective information being relayed to the audience, but the audience members themselves, and establishing a connection – for example, via the bridge of metaphor – can increase the effectiveness of the document. Metaphor humanizes a text partially by reminding the reader that an actual person produced it. At its core, technical communication is about helping people – helping them understand, use, create.

Metaphor is also relevant in relation to Iser's point that "…it is only through inevitable omissions that a story will gain its dynamism. Thus whenever the flow is interrupted and we are led off in unexpected directions, the opportunity is given to us to bring into play our own faculty for establishing connections – for filling in the gaps left by the text itself" (1005). Metaphor can fulfill this dynamism and stimulation for making connections in technical communication as the "inevitable omissions" and "twists and turns" do in literary texts, on a smaller but comparable scale.

The "gaps" created by metaphor are intended to be helpful, encouraging readers to connect something new and unclear with something familiar and understood. While they are not exactly the same kind of gaps Iser discusses, they achieve a similar end in that they take readers

out of the text temporarily, giving them a chance to sort out ideas, make interpretations, and actively searching for meaning. Iser states, "…no author worth his salt will ever attempt to set the whole picture before his reader's eyes. If he does, he will very quickly lose his reader, for it is only by activating the reader's imagination that the author can hope to involve him and so realize the intentions of his text" (1007). In the case of metaphor in technical communication, readers' imaginations are not running quite so freely, but they are nevertheless active and engaged. As Iser claims the "'unwritten' part of a text stimulates reader's creative participation" (1003), in technical texts, metaphor in stimulates within readers a kind of critical thinking and problem solving, but still imaginative, participation.

In order for metaphors in technical documents to aid readers' comprehension successfully, the author must first have some idea of the audience of the particular form of communication. Before producing a text, technical writers often analyze their audience and shape the material accordingly. The more aware technical communicators are of their audience – what the readers know and what they do not know – the better they can craft and organize the information being presented to expedite comprehension. Technical communicators sometimes have knowledge of what Rabinowitz refers to as *actual audience* (the "flesh-and-blood people" who will read a text) – often to a greater extent than writers in the literary field. However, in the same way as writers of literary texts, technical communications are primarily limited to writing for an *authorial audience*.

As Rabinowitz states, "Each member of the actual audience is different, and each reads in his or her own way, with a distance from other readers depending upon such variables as class, gender, race, personality, training, culture, and historical situation" (1043). When creating a

technical text, the author must keep in mind the differences among members of the actual audience and incorporate metaphors accordingly; otherwise, a metaphor could play a negative role in the communications.

However, Rabinowitz explains, the author is forced to speculate regarding audience to a certain extent:

> …he or she cannot begin to fill up a blank page without making assumptions about the readers' beliefs, knowledge, and familiarity with conventions…[thus,] artistic choices are based on these assumptions – conscious or unconscious – about readers, and to a certain extent, artistic success depends on their shrewdness, on the degree to which actual and authorial audience overlap. (1043)

In the case of technical communication, these assumptions are often related to the audience's level of knowledge and experience, and can be made based somewhat on the type of document being produced. If a technical communicator at a public relations firm were producing a communication plan for a large cable company, for example, he or she might assume that metaphors (and information being presenting in general) about television, cable and big business would be effective and easily understood.

However, a technical communicator developing a set of instructions on how to put a piece of furniture together could not assume that the user would know the names of certain screws, what tools he or she needs, and so on, because there is no certain base level of construction skill possessed by all buyers of unassembled furniture. However, the technical communicator could likely assume, for instance, that a user would understand a metaphor of turning a certain piece "in a clockwise motion," since anyone who is able to buy a piece of

furniture and attempt to assemble it is likely aware of the way and direction in which hands turn on a clock. Writers must make these decisions about the authorial audience in order to produce a text, and the assumptions are more likely to overlap with the actual audience if the writer employs common sense, careful consideration, and an understanding of the document being created.

Rabinowitz even uses a technical communication process – assembling a swing set using a set of instructions – as a metaphor for reading, stating:

> It comes with rudimentary directions, but you have to know what directions *are*, as well as how to perform basic tasks. It comes with its own materials, but you must have certain tools of your own hand. Most important, the instructions are virtually meaningless unless you know, beforehand, what sort of an object you're aiming at…The same is true of reading. You must be somewhere to begin with. Even when a text gives some fairly explicit guidance, you need to know how to recognize it and how to apply it. (1053)

The fact that a user must start from *somewhere* is the very reason metaphors are successful in facilitating understanding. Users may not understand new and complex ideas, which are often expressed in technical and scientific texts, but they do have some sort of foundation of knowledge. The key, then, is to determine what users' knowledge core consists of, based on the established authorial audience. If technical communicators understand the users in their audience to a certain degree, they formulate metaphors that successfully facilitate users' comprehension of complicated information through information that is likely already understood by and familiar to the reader. This methodology shows showing the reader, as Rabinowitz states, "how to recognize [the guidance] and how to apply it."

Heeding the guidance of Iser and Rabinowitz, the technical writer can employ metaphor to enhance communication in several ways: bridging the gap between technical communicator and audience by humanizing a document, engaging the reader by encouraging an active search for meaning and "filling in the gaps," and facilitating understanding by recognizing an authorial audience and establishing bridges accordingly.

Metaphor and the Historical Perspective

The appropriateness and value of the use of metaphor in technical communication can further be argued by considering the historical perspective of the discipline and tracing its evolution more thoroughly. In "History, Rhetoric and Humanism – Toward a More Comprehensive Definition of Technical Communication," one of Russell Rutter's primary arguments for improving the practice of technical communication is to "increase attention to its origin and development and to the tradition of humanistic rhetoric and the oratorical ideal to which it rightly belongs" (22). Rutter's claim is congruent with interdisciplinary and both/and thought, as is his acknowledgement and acceptance of the idea that what comprises and is befitting within technical communication has expanded.

Rutter further points out that technical communication is part of the liberal arts tradition, which "insists that the person thinking is more important than the tools used or the system acted upon" (22). Thus, an understanding of the origins of the technical communication and a corresponding liberal approach to technical communication enables opportunities to employ a more well-rounded bank of knowledge and strategy for the technical communicator. Rutter posits that viewing science and technology as purely objective and formulaic is reductionist and

purposelessly limiting, and, consequently, writings on these subjects need not be purely objective or formulaic either.

This idea also relates to Rutter's emphasis on the importance of humanism in addition to the pragmatic – another instance of both/and thinking in lieu or either/or. Essentially, technical communication is about helping people – helping them understand, use, create. It is not stagnant; rather, it is dynamic. As Rutter effectively states, "technical communicators, because they depend on both 'knowledge and practice,' because they rely on learning as a guide to experience, and because they need to bring eloquence, empathy, and imagination to the world of work are – and should be expected to be – rhetoricians" (29). As rhetoricians, technical communicators have a direct relationship with users, and the ability to understand, connect with, and anticipate the needs of those users should not be underestimated.

In his article "The Role of Burke's Four Master Tropes in Scientific Expression," David Tietge explores the role of literary and rhetorical tropes in scientific and technical discourse, referencing Kenneth Burke's *A Grammar of Motive*, in which Burke suggests that all forms of discourse rely on metaphor, metonymy, synecdoche, and irony to express ideas. Science and technical communication are no exception, and the inclusion of creative devices in the discourse of these fields is inevitable.

Tietge supports Bump's previous argument, stating that literary and rhetorical devices are often ignored because the fields are regarded as entirely separate or even conflicting. However, he states, "if we look closely at scientific explanations—especially those designed to inform a general public—we find that they are as reliant on, if not more so, than more 'subjective' forms of public discourse" (317). The author goes on to summarize that "contrary to what many

members of the scientific (and lay) community suppose, rhetorical and literary tropes are necessary components to a linguistic understanding of complex scientific concepts; that such tropes do not hinder our understanding, but are in fact necessary to it" (317).

With a variety of relevant theories established, an analysis of instances of metaphor in technical texts can be thoughtfully conducted. The next chapter illustrates how exploring actual examples of metaphor not only provides opportunities to apply theories of belonging, but also enables testing and supporting of those theories. The analysis serves as the next phase of the consideration of metaphor in technical communication, in which more a complete understanding of how metaphor functions in technical texts is achieved through examples and inclusion of guiding principles for the use of metaphor in such texts.

CHAPTER THREE: EXAMPLES OF METAPHOR IN TECHNICAL TEXTS

The variety and abundance of examples of metaphor found in technical texts not only speaks to the appropriateness and power of metaphor, but also provides insight regarding how technical communicators can apply it most effectively. Through thoughtful analysis of these examples, one can identify successful methodologies of incorporating metaphors into a technical text in order to connect with users and efficiently facilitate comprehension. The purpose of this chapter is to apply the scholarly theories of belonging explored in the previous chapter by examining documented occurrences of metaphor in technical texts, and to further expand upon these examples through the discussion of guidelines for most efficiently and effectively incorporating metaphor into a text.

Metaphor in Nature Texts and Popular Science Writing

The use of metaphor to artfully describe natural phenomena is prevalent in both nature texts and popular science writings. In Michael Bryson's article "Nature, Narrative, and the Scientist-Writer: Rachel Carson's and Loren Eiseley's Critique of Science," he explores scientist-writers Carson's and Eiseley's use of metaphor and other figurative language to describe natural phenomena and explain scientific concepts (369). Bryson asserts that their writings, which combine the genres of science writing, nature literature, and technical communication, discuss scientific matters with a precise yet eloquent and artful prose style to effectively connect with non-technical readers (369). Of course, the works of popular science authors have a broad appeal because of the effective use of metaphor as well, including, for

example, Lewis Thomas's *The Lives of a Cell: Notes of a Biology Watcher*, Stephen Jay Gould's *The Mismeasure of Man*, and Oliver Sacks's *Awakenings*.

Bryson commends Carson's incorporation of metaphor in her writings, stating that it "not only demonstrates her skill as a writer, but also provides insight into her perspective on nature and its relation to scientific practice and literary strategies" (372). He further acknowledges Carson's skillfulness in her methods of metaphor incorporation, as he posits, "…despite her enthusiasm for expressing wonder and celebrating beauty in nature, Carson does not romanticize the natural environment, nor does she draw explicit moral lessons from natural phenomena. Her use of metaphor is thus a carefully controlled technique that synthesizes literary expression and scientific accuracy" (374). This discussion offers valuable insight into the effective and appropriate employment of metaphor to enrich a text and facilitate connection and comprehension without misguiding the audience or interfering with the primary purpose of the text.

The author notes that Carson's subject matter naturally lends itself to figurative language, which enabled her to effectively incorporate metaphors remaining within the realm of nature. Bryson explains, "Natural phenomena themselves proved a rich resource of rhetorical ideas, as Carson taps into her readers' general knowledge of nature to describe unusual marine organisms, habitats, or behaviors" (372).

The author illustrates Carson's use of corresponding natural metaphors, citing her comparison of eels' migration patterns with the increase sunlight as time passes in the Arctic, using "one natural event [as] the explanatory tool for conveying another, less familiar process" (372). Bryson further explains the significance of this usage of metaphor, stating "…this

technique has an added and no less important effect: such metaphors reinforce Carson's view that all of nature is interconnected and unified; consequently, rhythms and processes in one part of nature correspond in form or function to other cycles and patterns" (372).

Bryson goes on to acknowledge the challenges of balancing subjectivity and objectivity, and the objections that often ensue in response to the humanization of technical subjects. He states, "From a strictly scientific perspective, anthropomorphizing nature is problematic…for it infuses subjectivity into ostensibly objective scientific discourse, indulging in potentially misleading rhetoric rather than straightforward empirical description" (372).

He argues, however, that such a perspective is unrealistically limiting, claiming "this view glosses over the fact that try as we might to be as objective as possible in our scientific descriptions of nature, we cannot help but anthropomorphize organisms and natural processes to some degree" (372). Bryson's discussion of nature and science writings expands upon and supports the idea that figurative language and creativity is well suited to technical documents, whose subjects are so often creatively inspiring and subjectively affecting.

Bryson further attests to the natural inclusion of metaphor in technical texts from a historical perspective, as he states, "…in the eighteenth and nineteenth centuries, when little distinction existed between popular and technical scientific writing, natural historians freely used anthropomorphic metaphors as one way to reach beyond mere physical description and thus communicate with a broad readership" (372-3). This reference concurs with the arguments put forth by Bump and Rutter, further suggesting that perhaps it is only our own constructed classifications of genre that prohibit, or advise the prohibition of, metaphor and other types of language typically designated as "literary" or "rhetorical" from being used in technical texts.

Metaphor in Scientific Texts

Metaphor also occurs frequently in scientific texts. In "The Uses of Metaphor in Citation Classics from the Scientific Literature," Joseph E. Harmon observes to the frequency and range of use of metaphor in technical communication. Harmon succinctly explains that an effective metaphor can achieve three main purposes:

1. To introduce colorful imagery into what otherwise would be an ordinary (or plain) expression. This effect is primarily decorative.
2. To convey information inexpressible, or at least not easily communicable, by ordinary language. This effect is explanatory because it gives a better understanding of some object (how it behaves, what it looks like, what it feels like, etc.) or makes the abstract concrete.
3. To express something more concisely than possible with ordinary language. (180)

He also notes an additional function of metaphor, stating that it can assist in problem solving, especially in science. Harmon further acknowledges metaphor's contribution to scientific progress, "particularly in the formulation of new theoretical constructs," citing a number of milestone metaphors in the field, including, "the workings of the universe and clockwork," "the behavior of light and that of waves and particles," "the sequence of bases in genetic molecules and a code," and "the birth of the universe and the big bang" (180), among others.

Rather than explore these big-picture metaphors in depth, Harmon instead conducts an analysis of how and why authors use metaphorical constructions in scientific papers. He reviews

89 journal articles from the 400 most-cited documents from 1945 to 1988 in the *Science Citation Index* database and finds that metaphors are used often and in a variety ways. Harmon first explores central metaphors that are "intimately connected with the major discovery being reported" (183). These metaphors include ribonucleic acid (RNA) as *messenger* (183), the Buddhist term *eightfold way* to describe "eight stable or metastable baryons as aspects of one particle" (184), and "cell membranes as *mosaic* structure of oriented globular proteins and lipids" (184), all of which employ metaphors unrelated to science to explain complex scientific discoveries to the audience.

Harmon goes on to provide two examples of scientific metaphors that actually influenced and enabled scientists' discoveries, including "the surface membrane of a giant nerve fiber to an *electric circuit*" and "the action of a biological cell to that of an electro-chemical *fuel cell*" (185). Thus, the author states, "…metaphor [not] only functions as an explanatory device to communicate a discovery or observation, but also actually contribute[s] to the process of scientific argument and invention" (182).

Transitioning to non-central metaphors, Harmon explores metaphorical technical terminology and usage conventions, stating, "The vehicle of metaphor, quite often, is an image drawn from nature or human experience. A well-chosen such metaphor helps the reader visualize and remember a new concept or thing and helps the writer concisely communicate that concept or thing" (187). In support of this argument, he lists many original metaphorical terms invented by scientists to explain new phenomena, as well as standard metaphorical terms that reinforce already-established metaphors.

Harmon further discusses the result of the frequent occurrence of such metaphors, stating, "Certain specialties…use so many metaphorical technical terms that the resulting texts possesses a kind of poetic gloss that deviates from the dry literal prose one normally encounters in scientific papers" (188). This observation reinforces metaphor's subsidiary function of aesthetically enriching a technical text.

Timothy D. Giles also cites many examples of the use metaphor in scientific articles documents in his article "The Missing Metaphor," claiming that metaphor has been acknowledged and documented as a tool for successful instruction (273). The author examines articles published in *Time*, *Nature*, *Nature Biotechnology*, and *Science* that recount the cloning of the sheep Dolly and finds an array of figurative language, which includes a wealth of metaphors, used to describe the event.

The author notes metaphor's ability to define a revolution in science, to encourage scientists and society to reexamine their interpretation of phenomena and develop a new, more sophisticated understanding (273-274), as also touched upon by Harmon. In his article, Giles aims to pinpoint one such "generative metaphor for cloning, to observe its effect on subsequent publications, and to note other usages of figurative language in these articles to discern how they may contribute to a central metaphor" (374). However, the author concludes that while the writers each use metaphorical expression in the articles, no single central metaphor emerges as a primary illustration of the cloning of Dolly.

The variety of metaphors used in the articles to describe the cloning of Dolly serve to facilitate quick comprehension of parts of the process, rather than a comprehensive understand of cloning as a whole. While Giles does not identify a single central metaphor from the sampled

articles, his discussion of the subject is no less effective. His article further supports the notion that in addition to helping individual readers comprehend complex or new concepts, a central metaphor can be used by many communicators to unify the explanation of a phenomenon within a technical community.

Metaphor in Computer Documentation

In computer documentation, metaphor can enable users to understand a new technological concept or process before they actually engage in the use of a program or application. Though Richard M. Chisholm's "Selecting Metaphoric Terminology for the Computer Industry" was published more than 20 years ago, discussion of the use of metaphor in computer documentation remains relevant, as the generation range of computer users continues to expand. Chisholm explains, "Well-selected metaphoric terminology can reduce the fear and ignorance that often dishearten first-time computer users and can help them grasp new concepts and procedures" (195). The author cites metaphors such as *bit* and *byte* as examples that render computer documentation more entertaining and colorful, and metaphors such as *menu* and *wild card* as examples used to enlighten the audience (195).

However, Chisholm warns, not all metaphoric terminology that is frequently used in computer-related discussion is well-received by users, stating, "They bridle at words like *memory* and *intelligence* applied to computing machinery. They are annoyed by casual uses of *interface* and *parameter* or puzzled by words like *spool*, *boot*, and *argument*" (195). To remedy this potential shortcoming, the author outlines seven criteria based on usability to guide the incorporation of metaphor in computer documentation:

1. Is a metaphoric term needed?

2. Is the old word familiar?
3. Is the metaphoric relation close?
4. Is the usage of the word consistent?
5. Is the metaphoric word brief?
6. Is the metaphoric usage acceptable?
7. Is the metaphoric word memorable? (195)

Though these principles might seem relatively simple, they can essentially dictate whether or not a metaphor is effective.

As discussed, metaphor, when used effectively, can improve a document substantially; however, when used irresponsibly or without sufficient audience knowledge, metaphor can actually render a document unsuccessful. “From Fighting Fires to Building Bridges: The Role of Metaphor in Systems Requirements” by Dermot Casey and Catah Brugha and “Broken Metaphor: The Master-Slave Analogy in Technical Literature” by Ron Eglash offer cautionary advice to the technical documenter regarding the use of metaphor. Casey and Brugha assert that metaphors should not reduce their subjects and discuss the need to use metaphors that do not cause an unconscious oversimplification of the complex processes involved in systems development. While metaphor can help readers understand complicated ideas or processes, it is essential that they do not oversimplify what they are being used to explain. This could cause a user to believe they understand a concept or instruction when in fact they do not, which could result in a range of detrimental consequences, not limited to frustration and failure.

Even more concerning, as social scientist Ron Eglash points out, is that it is possible for metaphor to play a particularly *negative* role in a technical document if used poorly. He points

out that “the use of the term ‘master-slave’ is quite common in technical descriptions of control relation between two devices: automotive clutch and brake systems (master cylinder, slave cylinder), clocks, flip-flop circuits, computer drives, radio transmitters, and others” (360) in a variety of documentation. This metaphor can unnerve, alienate and certainly offend the reader, making it impossible to achieve the goal facilitating comprehension. While this metaphor may be vivid, Eglash states that it is “ethically suspect,” and that surely technical communicators and documenters can produce a more suitable comparison to express this idea. Thus, it is imperative that technical communicators carefully consider whether a metaphor is appropriate as well as whether it will be effective.

Monique N. Mulder offers practical examples of metaphor in software documentation in her article “Perception of Anthropomorphisitc Expressions in Software Manuals.” She asserts that the most easily understood concept for humans is actually the human being, the metaphor of which is referred to as personification or anthropomorphism (502). She states, “Expressions in which it is suggested that programs have feelings, have some affective relationship to us, that they are able to communicate intentional activities through human language use and to perform non-routine (mental) activities, appear to be perceived as anthropomorphistic” (502). Furthermore, she supports this anthropomorphism, stating, “the characteristics of affection and non-routineness seem to fit well into the common idea of humans as emotional, creative, and unpredictable beings as opposed to computational, automatic, emotional machines” (502).

Mulder explains that the use of such metaphors in software manuals is a practice that can help readers understand how to use a computer program more easily via relatability and familiarity. She posits, “ [the] strongly anthropomorphizing effect of affective expressions

revealed...suggests that anthropomorphism might be most powerful in motivating people to work with computers – which could provide a positive attitude to learning" (502). Thus, by using an actual humanistic metaphor for software, the documenter can essentially connect the user to another person, and this kind of connection can contribute to the user's comprehension and success.

Through its development and advancement, technical communication has shifted from a focus on content to a focus on the user of the document. This remodeling of the field translates to a focus on task orientation, which Thomas T. Barker strongly emphasizes in *Writing Software Documentation* and defines as "a design strategy for software documentation that attempts to increase user knowledge of and application of a program by integrating the software with the user's work environment" (10). Barker asserts that the purpose of computer documentation is to assist a user in performing a task as easily, efficiently, and accurately as possible. Therefore, the focus is not on the task itself, but on the *user* and his or her individual result in a particular setting. Software functions for a specific user, and within that user's work environment – not by a machine, nor in a vacuum.

The user's goal should be the technical communicator's goal. Regarding task orientation, Barker explains, "If the documenter has done the job well, the user will not just press the correct key or button but do so in the context of meaningful work…the key to usability lies in describing operations in such a way that they're meaningful to users" (426).

In addition to textual metaphors, Barker also explores the idea of visual metaphors related to identifying users' needs for graphics. He explains that "metaphors show the basic nature of an idea by relating it to something the user already knows" (411), but expands the definition beyond

text to graphics as well. Barker provides examples of these graphic metaphors, such as a font that looks like typewriter to indicate typing, and a graphic of a paint bucket to indicate filling an area, such as in MS paint, a simple program with which many computer users are at least somewhat familiar (414).

Graphic metaphors and textual metaphors both facilitate understanding by linking something unknown or complicated with something familiar and simple in another domain – as Barker states, they "allow the user to know something without having to learn it from scratch. Users can rely on their previous experience in the world to do some of the explaining for them" (411). Thus, metaphors bear some explanatory burden, and provide a "workaround" for complicated software terminology. Barker further explains, "metaphors of language, where we compare two things, gain strength when we support them with the actual images suggested by the words" (412), and he provides the example of the "MS-DOS 5-minute workout" containing graphics of runners, gym equipment, etc. to support and augment the metaphor. A documenter can therefore incorporate both textual and accompanying graphic metaphors to facilitate user comprehension most efficiently and effectively.

Metaphor in Product Documentation

Metaphor plays a unique and vital role in product documentation, in that it enables a user to "experience" a product vicariously before initiating the use of that product, thereby avoiding product failure or more damaging results. In "Technical Communicators as Purveyors of Common Sense," Pete Praetorius discusses product documentation and strategies to increase its effectiveness, including the use of common metaphors. Praetorius notes that when creating documentation, technical communicators often expect users to employ a certain level of practical

judgment; unfortunately, if that expectation is not met, the consequences for the user can be damage to the product, injury, or even death (337). Therefore, Praetorius argues, instead of assuming the user will apply common sense, it is advantageous to encourage, enable, and help develop that common sense.

After exploring definitions of common sense, Praetorius offers insight about the use of metaphor that is relevant to our discussion. The author laments, "Unfortunately, a lot of technical writing is written as though it was created for and by machines rather than by one person for other people" (346), as has been previously discussed. Such writing often results in a lack of understanding within the user. He notes that one way technical communicators can avoid this is to equip users with common sense about a product by helping them experience it vicariously, since there is little room for error if immediately experiencing a product firsthand.

Praetorius states, "…technical communicators can play a part in promoting a continuity of experience among a product's users is through the use of common metaphors" (347). He goes on to provide the example that "the folder icon used in Windows and Mac operating systems are much easier for new users to conceptually visualize than the architectural—and very Cartesian/mechanistic-reductionist—multilevel directories" (378). Praetorius's discussion is significant because it establishes yet another benefit of metaphor in another type of document. In this case, metaphor is not only a purveyor of common sense, but actually enables product preservation and success, as well as safety, which is an especially important consideration for technical texts. Praetoius effectively summarizes:

> Through the use of scenarios, common metaphors, and language that promotes procedural knowledge, technical communicators can help to provide users with a

> continuity of experience and strengthen their common sense understanding of a product. By ignoring common sense appeals, technical communicators are turning their backs on a pragmatic tradition and are passing up a sound persuasive opportunity. (349)

Variations of Metaphor

Many scholars have explored variations of metaphor, such as "scientific analogies" and "poetic metaphors," to analyze whether distinctions exist among them. Michael D. Finney distinguishes between metaphor in technical communication and metaphor in other fields in his article "An Approach to Understanding and Using Metaphor in Scientific and Technical Writing." He claims that the strength of metaphor lies in its ability to facilitate comprehension, and that technical metaphors, unlike poetic metaphors, attempt to relay meaning that is functional rather than exclusively artistic (751-2).

Finney also acknowledges that the appropriateness of metaphor in technical texts has been questioned and criticized, and offers the following possible reasoning:

> [The] distance between writer and reader is brought about because metaphors may hold many meanings and readers may transfer varying degrees of unexpected meaning. When writers employ metaphor, they generally assume that the reader will make a metaphorical interpretation of the text opposed to a literal one. Such assumptions mean that writers expect the reader to transfer only certain characteristics to determine meaning. However, this expectation may be unreasonable. (752)

However, Finney proposes Chisholm's guidelines as a sufficient safeguard against such incorrect interpretation by the reader, and concludes with an advisory thought, stating, "Since technical metaphor is already embedded in technical and scientific writing, writers should work at using metaphor more skillfully rather than trying to eliminate it altogether" (753).

In "Are Scientific Analogies Metaphors?" Dedre Gentner also examines the difference between two types of metaphors, supposing that literary metaphors are more complex and rich than scientific metaphors, which are usually clearer, more specific, and more systematic to aid in reader understanding. Gentner argues that "complex analogies can be psychologically characterized as structure-mappings between domains" (127) and that "this framework allows us to state structural distinctions that distinguish good explanatory-predictive analogy from other kinds of metaphor" (128).

She asserts that literary metaphors are aesthetic and serve as tools of expression, while scientific metaphors are factual and used primarily for explanatory purposes, but answers her initial question of "Are Scientific Analogies Metaphors?" with "yes and no" (128), claiming they are more similar than not.

In his article "Literary and Nonliterary Aspects of Metaphor" Gerard Steen uses Gentner's insights as a platform for further examination and supposes that a distinction between metaphor and analogy cannot be made based entirely on field of communication – that is, literature or science. Steen elaborates on the discussion of the constructed boundaries of discipline initiated earlier in this chapter, stating:

> The concepts of scientific and literary discourse are socially constructed, that is, defined as domains of discourse in which people can participate by means of

> various capacities or roles: as readers or as producers of texts, for instance. Types of discourse are defined at a macro-social level through aesthetic and polyvalence conventions or, on the contrary, through factual and monovalence conventions. These conventions embody the aims, needs, and abilities of people as they participate in a particular domain of discourse. (690)

This explanation sets up his claim that "it is incorrect to call the scientific phenomenon 'analogy' and the literary one 'metaphor'" (691), and his subsequent mission to reformulate the terms.

Ultimately, Steen claims that the impact and comprehension of metaphors, and whether there is a difference between those in literature and those in science, is determined by a number of factors that cannot be defined by field alone. The author explains that "distinctions have to be made among the various stages of a metaphor's impact: in literary reading, ordinary and quick reception is probably different from repeated reception, which in turn may be different from study or from criticism" (703).

Steen argues that in order to distinguish between the role of metaphor in literature and the role of metaphor in science, it is necessary to analyze differences at each of these stages. He further claims, "It may very well be that, at the level of quick and automatic comprehension, their impact does not differ at all," (703), but acknowledges that further empirical evidence is required to substantiate this idea.

Though application informs and enriches the analysis of metaphor in technical communication, the subject is so expansive and implicative that its exploration will likely never be complete. The more technical communicators use metaphors in technical texts, the stronger the argument for their inclusion and acceptance, and the more examples available to analyze and

learn from. The next chapter provides a brief summary of the issues discussed in this chapter and the previous chapter, and offers insights regarding additional opportunities for consideration and study of metaphor in technical communication.

CHAPTER FOUR: CONCLUSION

The use of metaphor has long been significant and frequent in technical communication, and seems to only increase in commonness and acceptance. As illustrated by the previously cited scholarly research, this device not only lends itself naturally to technical and scientific writings, but also increases the effectiveness of those texts in many ways. When used responsibly, metaphor and other creative devices can enhance technical communication by facilitating understanding and bridging the gap between technical communication and audience.

However, the struggle of technical communication to establish its place within the university, which has far-reaching implications for the use of metaphor, is certainly not a new one, nor is it one that has been fully resolved. Technical communication is perhaps still cementing its place of belonging in the university, and technical communicators are still striving to learn how to balance subjectivity with objectivity, humanism with science, and creativity with clarity.

The following is what I consider to be an interesting illustration of technical communication and its classification in the university setting: In a previous course during my study in the technical communication master's program, I took part in a group project to produce a recommendation report regarding the University of Central Florida's online master's degree program in technical communication that launched in fall 2007. We conducted research on ten other schools that already had similar programs already in place, and found that half of the schools categorized their technical communication programs within the domain of Master of Arts, the other half within Master of Science. In many ways, technical communication is a work-

in-progress, but its ever-evolving nature can only enable its professors and students to achieve deeper understanding, effectiveness, and balance.

The technical communication field might benefit from further practical study on the use of metaphor – for example, usability testing of documents that incorporate metaphor versus those that do not, in a range of situations, such as the workplace, online classroom, or research lab. More in-depth feedback from actual users of technical documents that incorporate metaphor would be helpful in determining why certain techniques are effective and others are not. Furthermore, it would substantiate whether literary metaphors do in fact differentiate from scientific metaphors. As Steen states, "At the most extended level of study, however, their functions may indeed differ, with monovalence and polyvalence as well as facticity and aestheticism acting as arbiters of their success in science or literature, respectively" (703). However, without specific empirical study to determine this, one can only speculate (703).

Most of the articles that address the use of metaphor in technical communication, including the sources explored in this thesis, are either theory-focused or empirically focused. Perhaps the best way to explore the subject in depth and determine how metaphor affects users would be to discuss a particular theory, whether new and original or already established, and then apply it by conducting a usability study using technical texts that employ metaphors versus technical texts that do not include metaphors. This methodology would provide an understanding of exactly how metaphor links a user with a text, and whether it enables more effective comprehension of technical content. Immediate feedback from users would offer valuable insight into how a metaphor is interpreted and associated, and the resulting user response. The greater

understanding we have of how creative devices function in technical documents, the better we will be able to incorporate them effectively and achieve the goals of audience comprehension.

Such a usability study could also employ an advanced and modern application of the shift to user-focus – the audience involvement in the development of a form of technical communication as discussed by Robert R. Johnson in his article "Audience Involved." Johnson explains, "The very nature of technical communication begs for conceptions of audience because technical writers are fundamentally charged with the responsibility of translation information from one context to another" (361).

Accordingly, Johnson proposes a system that goes beyond the technical communicator simply understanding his or her audience to actually involving the audience in the creation of a technical text by providing immediate feedback, as Johnson discusses usability as "a part of an iterative process that allows users to provide feedback during the conceptual design and production stages of a product's development" (365). In this process, technical communicators function as usability specialists, and Johnson further advocates an approach to usability that "is not just end-of-the-line testing; rather, it is a process of discourse production fro m beginning to end.

The author outlines the resulting advantages as a result of considering usability in this extended view, including that it "furthers arguments for the *early* inclusion of technical communicators in the development process" (365). Johnson elaborates on a second advantage that if technical communicators are "part of the development continuum, then we might be perceived as part of the development team, rather than just the scribes who 'write up' technical information" (365). Finally, the author notes a third advantage, stating:

> …writers can effectively implement audience knowledge (and here I mean user knowledge) into the development process. In this way technical communicators are modern rhetoricians – experts of audience analysis. Usability specialists take audience analysis into a new context – the context of technological use – and study how this interactive audience users various texts that reside in a given discourse community's arena. (365)

Applying this "participatory model of writing" to technical texts that include metaphor could provide the valuable opportunities previously discussed, including interaction between technical communicator and user to understand exactly how users react to the metaphors such texts. The ability to use "practice users" to test metaphors for effectiveness and efficiency before wide distribution of technical text would be invaluable to all involved, saving money, time, avoiding misunderstand and alienation, and all but ensuring success on a broad scale, similar to the benefit of Praetorius's protective approach to product documentation in which metaphor serves as a buffer between user and product implementation.

Like many fields, technical communication is ever evolving, as its participants increase their understanding of what works and what does not. If the ultimate goal of the area of study and practice is to facilitate learning and understanding and application for the audience, it makes perfect sense to apply the ultimate exemplification of user-focused technical communication in the form of actual user involvement. This progression is an arguably positive change in the field and profession, as it will increase technical communicators' understanding of their audience through forming a direct relationship *with* the audience, and the instant response from the audience will likely save time, money, and effort while increasing the effectiveness and success

of the communication. Such a pursuit is decidedly invaluable, based on the extensively illustrated central role of metaphor in technical communication.

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