



2013

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Eck, Nichole (2013) "Wittgenstein, Language, and Mathematics in Paul Auster's *City of Glass*," *Criterion: A Journal of Literary Criticism*: Vol. 6 : Iss. 1 , Article 6.

Available at: <https://scholarsarchive.byu.edu/criterion/vol6/iss1/6>

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wittgenstein, language, and mathematics

in Paul Auster's *City of Glass*

Nichole Eck

Bertrand Russell, one of the founders of Analytic Philosophy and mentor to Ludwig Josef Wittgenstein, called Wittgenstein “the most perfect example I have ever known of genius as traditionally conceived, passionate, profound, intense, and dominating” (Russell 329). Wittgenstein’s early work *Tractatus Logico-Philosophicus* forever changed the field of analytic philosophy, and the Baruch Poll ranked his posthumously published work *Philosophical Investigations* as the most important book of twentieth-century philosophy (Lackey 331). Wittgenstein’s work is divided into two clear periods, referred to simply as his early work and his later work. His early work focused on the tradition of Analytic Philosophy of his time, which encouraged a view of language as a series of symbols and signs with absolute, clearly defined meanings and referents that could be summarized, described, and put together in pieces like a math equation. His later work rebelled dramatically against his early work and began to encourage a relativistic, pragmatic view of language

in which meaning was not absolute, but dictated by its use and consequences within a society. Under this new view, many philosophical problems Analytic Philosophy had attempted to address became mere grammatical misunderstandings, stemming from philosophers redefining terms outside of society and using words abstractly and out of context. Paul Auster's *City of Glass* addresses many of the same issues that concerned Wittgenstein, including naming, reference, descriptors, and the pragmatic use of language. Although Auster never explicitly mentions Wittgenstein or his theories in *City of Glass*, he highlights the flaws in Wittgenstein's early work in mathematizing language by giving examples of names with multiple possible referents, referents with multiple possible names, and ambiguous and pseudonymous allusions. Additionally, Auster portrays two characters whose attempts to find meaning in language through mathematical methods and without the aid of society incur severe consequences.

Wittgenstein's ties to postmodernism and Paul Auster's work, particularly *City of Glass*, are well supported. An important characteristic of postmodern literature is its interest in dissecting language and meaning. According to the Stanford Encyclopedia of Philosophy, the term "postmodern" became widespread after its use in an article by Jean-François Lyotard which applied one of Wittgenstein's theories from his later work to modern art and philosophy (Aylesworth). In an interview with *The Washington Post*, Paul Auster states,

As a young student at Columbia in the '60s, I read Wittgenstein's work very carefully and very avidly. I didn't always fully understand it. But I was always intrigued and inspired by it. Definitely the later work interests me more than the early work, particularly the philosophical investigations. (Auster, "Off the Page")

Auster mentions Wittgenstein explicitly in two of his works of fiction: in *The Book of Illusions*, among a list of authors of books meant to show "wide-ranging tastes in literature," and in *The Brooklyn Follies*, as a character remembers reading in a biography about Wittgenstein's nervous breakdown and subsequent recovery (283). Additionally, Wittgenstein posthumously published *The Blue and Brown Books*, a compilation of notes and dictations of lectures he gave at Cambridge. The similarities between these books and Daniel Quinn's red notebook are striking, as is the nominal connection to Private Investigators Blue and Brown introduced later in the New York Trilogy. Perhaps the most

indicative piece of evidence supporting a Wittgensteinian reading of *City of Glass* is Auster's statement about the book's epigraph:

At one point, as I was writing *City of Glass* many years ago, I was considering using a phrase from Wittgenstein's *Zettel* as an epigraph for the book. The sentence is this: "And it also *means* something to speak of 'living in the pages of a book.'" (Auster, "Off the Page," emphasis added)

The idea of living in a book is clearly applicable to Quinn's own travels as both an author of books and a character within a book, but the more important part of this dedication is the idea of a phrase *meaning* something, actually communicating a sense of some idea even if the phrase, like the phrase "living in a book," is literally impractical. Auster appears somewhat obsessed with Wittgenstein and his ideas about the importance of language and meaning.

The philosophical discussion Wittgenstein entered into in the 1920s and 1930s was preoccupied with treating language as a mathematical equation, in which every word could be broken down into its meaningful parts. This so-called Analytic Philosophy used elements of predicate logic, also known as predicate calculus, to divide the overall meanings of words and sentences into their meaningful parts. Believing that philosophy's job was to clarify how language could best be used, philosophers, Russell and Wittgenstein in particular, attempted to classify existing language into a mappable, definable system with clear rules and elements. They dedicated a large part of their efforts to determining how mere names (e.g. "Aristotle") and descriptors (e.g. "the teacher of Alexander the Great") refer to objects in the real world when used in abstract language. Many philosophers believed that the meaning of names and descriptors was solely their physical referent. However, Wittgenstein later decided that meaning could not be so mundanely articulated through a perfect theory of reference, a view which Auster supported as well.

When considering Wittgenstein's theories of language and meaning, *City of Glass* can easily be read as a dramatization of the ways in which language as math breaks down in use, particularly in the view of language as a mathematical function. Functions are the "central objects of investigation" in most modern fields of mathematics and are "undoubtedly the most important concept in all of mathematics" (Spivak 39). In math, a function is defined as a mathematical relationship that assigns exactly one element of one set to each element of the same or another set. In other words, every value input into a function has exactly one output. A function fails when a single input is put into a function

and, at different times, produces different outputs. For example, in the function $f(x)=x+1$; $f(4)$ will always equal 5, no matter how many times or under what circumstances 4 is put into the function. If a function were to provide a different output for the same input, it would no longer be a function; it would show no mathematical significance, have no meaning.

If one extends the metaphor of language as a function to view names and descriptors as inputs and their physical referents as outputs, we may begin to see examples of language as math breaking down in the ways Auster and Wittgenstein believed it would. The most obvious example of a name being used to refer to different people at different times is the name of Paul Auster. The language function of naming should map all names to the object of reference. When first read in the novel, the name “Paul Auster” refers in the reader’s mind to the author of *City of Glass*, a flesh and blood person in the world of the reader. However, within the first chapter, a second Paul Auster is introduced into the story, a mysterious detective someone is trying to reach via telephone. Soon after, Daniel Quinn adopts the name Paul Auster as a pseudonym. In chapter ten, Quinn meets another Paul Auster, a writer from the world of *City of Glass*, whose wife and child share names with the wife and child of Paul Auster, the book’s author. By chapter eleven, any time the name “Paul Auster” is mentioned, the reader must guess which of the possible referents the author intends and grapple with the fact that, for experiment’s sake, the author might not have clearly intended any specific referent. In this case, the input “Paul Auster” returns any number of different outputs depending on the circumstances at any given moment. There is no purely logical way to deduce which referent is intended just through the words, revealing one of the issues with which philosophers of language had to struggle.

Auster also explores the idea of descriptors as unclear referents that break down the mathematical function of language through many of the allusions involving authorship in *City of Glass*. The most obvious example of this is the descriptor “the author of *Don Quixote*,” whose complex possible identities are discussed in the latter section of *City of Glass*. The writer Paul Auster in the novel points out that most people would claim Miguel de Cervantes as the author of *Don Quixote*, even though in the novel the author is claimed to be Cid Hamete Benengeli. Character Auster goes on to lead the reader through a list of possible authors, from Sancho Panza who was the only one to witness all the events of the novel, to the barber and the priest who must have written down Sacho’s words, all the way back to Don Quixote himself, who orchestrated the

whole story himself to test the gullibility of the human race. In lieu of this discussion, the descriptor “the author of *Don Quixote*,” when input into a function, can produce multiple outputs, both real and fictional. Similar issues are seen in Auster’s reference to Marco Polo’s *Travels*, which are of disputed authorship, and Haydn’s opera “Il mondo della luna,” which had two co-authors but a history of one author being favored over another.

Another problematic feature of the language function of naming is that it is non-invertible; it has no inverse function. An inverse function is a mathematical function that undoes the effect of another function. For example, there is a function that will convert Celsius temperatures to Fahrenheit temperatures (i.e. Celsius is the input, and Fahrenheit is the output). There is also an equation that will do the opposite: convert Fahrenheit temperatures to Celsius temperatures (i.e. Fahrenheit is the input, and Celsius is the output). In this way, one is able to determine the input of the original function by inputting the original output into a new, inverse function.

However, some functions are not invertible, and this property causes some difficulty and ambiguity in other mathematical processes. A good example of a non-invertible function is the case of the function $f(x) = x^2$. The inverse of this square function, as it is called, is the square root function, or $f(x) = \sqrt{x}$. In this case, there are always two inputs that will produce the same output (e.g. -22 and 22 both equal 4). This is not a problem for the original function, but makes the function non-invertible because, by observing the original output of 4, one can never be sure which of the two possible inputs was the original input. By nature of the original square function, we lose any information that could tell us whether the negative or the positive answer is correct.

Auster also gives examples of characters with multiple names or identities that show the inverse language function failing to match names to their correct referents. In the original function, names are input and return physical referents; in the inverse function, physical referents are input and return names. For example, throughout the novel, Daniel Quinn assumes several names or identities, including Daniel Quinn, Paul Auster, Max Work, William Wilson, and Peter Stillman Jr. If one were to submit the physical person of Daniel Quinn into the inverse language function, there are several possible outputs of names and no way to tell which of the answers is correct (just like the square root function). Another case of this is Peter Stillman Jr. who, in his first conversation with Daniel Quinn, provides several of the names by which he knows himself: Peter Stillman Jr., Peter Nobody, Mr. Sad, Peter Rabbit, Mr. White, and Mr. Green.

One must also consider the first nine years of his life, in which he had no name at all to speak of. Using the person of Peter Stillman Jr. as an input in the inverse function may produce any one of his many names, or non-names, so to speak, again with no way to determine the correct one. There is no perfectly binary relationship in the regular or inverse language function of naming.

Having drawn out the similarities between language and math, it is also significant to note the differences between them, particularly that mathematical knowledge can be determined *a priori*, but knowledge pertaining to language and meaning cannot. When faced with a non-invertible function, mathematicians in some cases are able to compensate for the errors in the function and determine the original output through secondary means. For example, once a mathematician realizes that the square root function does not allow for possible negative answers, he can test both the positive and negative versions of the answer that a square root function returns in the larger context of the equation. However, language does not allow for its speakers, merely by thinking harder, to test all possible solutions and determine the correct one. While in the case of the square root function, there are only two possible answers in any given situation (the positive and the negative), in the case of language functions there are infinite possibilities and no purely logical way to deduce the function's original input.

There are ways in language to determine correct meanings and referents, but this can only be achieved by active social interaction between members of a society and an exchange of information. For example, when employing a pronoun-creating language function, a person may use a noun and then, through clear syntax, substitute a shorter pronoun. For example, if I say, "I enjoyed the soufflé; it was delicious," those listening will understand to what I am referring with the pronoun "it." In this use of the pronoun-creating language function, I have input the word "soufflé" and received the word "it"; meaning is transferred, signaling an effective language function. However, this pronoun-creating language function is not invertible. If someone were to enter the conversation having only heard the phrase "it was delicious" (with the pronoun "it" being the inverse input), it would be impossible for them to deduce logically the original noun (i.e. the inverse output) and therefore the referent of the pronoun "it." They could not possibly test all of the possible nouns to which that pronoun could refer, even by eliminating possibilities through the context of the conversation. The listener must instead exchange information with the speaker. In effect, the listener will provide the information, "I did not understand the

meaning of this word” to the speaker, and the speaker will in exchange supply the listener with the intended noun or referent.

As with the previous example, Wittgenstein’s later work claims that society is necessary to provide avenues for interaction between people to clarify meaning. Just as Wittgenstein’s work began to progress the work of Analytic Philosophy and treating language as math, he began to believe it mistaken in its methods and assumptions. In response to it, he crafted a new theory dubbed “Ordinary Language Philosophy” that gained momentum in the 1930s and 1940s. This new philosophy determined that language finds its meaning solely through its use in society, rather than through predetermined and definable meanings that accompany each word. According to Wittgenstein, “the meaning of a word is its use in the language” and can only be decided upon by observing the functioning consensus of members of a society (*Philosophical Investigations* xxiii). Essentially, Wittgenstein decided that “ordinary language is all right” and that it can “take care of itself” (*The Blue and Brown Books* 28; *Tractatus* 127). To compensate for language’s shortcomings, society has adjusted, and will continue to adjust, to determine meaning in language and preserve the meaning-bearing mechanism of language. However, this act requires the implicit agreement of an entire society on what language means, not a few philosophers attempting to logic language out.

Auster uses several characters in *City of Glass*, most notably Peter Stillman Sr., as examples of the extremely negative consequences of treating language mathematically. One of Peter Stillman Sr.’s interesting theories about language is that things should be named according to their function. However, Stillman observes that the physical objects of the world break, becoming unable to fulfill their function, yet they are still named according to their previous function. In explaining this referential problem to Quinn, Stillman uses the example of a broken umbrella, which is still called an umbrella even when it can no longer be used to keep a person dry. In this way, Stillman claims, “our words no longer correspond to the world” (121). Stillman travels around New York City, where “brokenness is everywhere,” to collect items, “from the chipped to the smashed, from the dented to the squashed, from the pulverized to the putrid,” and give them names (121, 123). At their core, Stillman’s actions seem to be a compulsive need to try and compensate for the failures of language as a function. Stillman has understood that the naming function of language will produce multiple physical referents as outputs; both the functioning umbrella and the broken umbrella are returned by the name “umbrella.”

This attempt to fix the function of language reveals a second underlying way in which Peter Stillman Sr. treats language as math: he believes that there are absolute, right-or-wrong definitions or meanings to words reachable by empirical study. While following Stillman, Quinn observes him “poring over” bits of junk that he finds, examining them intently, and then writing something down in a small, red notebook. Quinn has apparently witnessed Stillman’s scientific process of naming. When Quinn asks Stillman how he can be sure if he’s found the right word for broken objects, Stillman replies simply, “I never make a mistake. It’s a function of my genius” (123). Stillman clearly views language as math, in which a name is either right or wrong *a priori*, regardless of societal input. We can see this belief in the extreme in Stillman’s belief in an Adamic language, or language of God. As Peter Stillman Jr. says of his father, “He wanted to know if God had a language. . . . The father thought that a baby might speak it if the baby saw no people” (33). To test his theory, Stillman Sr. locks his son in a room, “cover[s] up the windows, and ke[eps] him there for nine years,” giving him “an entire childhood spent in darkness, isolated from the world, with no human contact except the occasional beating” (44–45). With this cruel experiment, Peter Stillman Sr. shows his dedication to the belief that a better language can be discovered through empirical methods, stumbled upon like a mathematical proof. However, this dedication permanently ruins his son’s ability to communicate normally with others even after years of normal exposure to society.

In his self-assigned work of deciphering the meaning of language, Peter Stillman Sr. dooms himself by ignoring the most powerful voice in deciding pragmatic meaning: society. He accepts his task of creating a new language solitarily and precociously, claiming that “he can’t be bothered by the stupidity of others” (121). He plans only to share his work with the rest of the world when he has completed his research and renaming. Stillman, in his arrogance, overlooks the fact that language’s first purpose and function is to communicate meaning within a society. There is no absolute right or wrong to reference; there is only what members of a society accept and agree has meaning. There must be an implied social acceptance of any language if it is meant to achieve its function of transferring meaning between members of a society. Can a language which can no longer achieve its function of communication truly be called a language? One man attempting to rewrite human language will never be able to communicate with others without reverting to the common human language that they do share.

The negative effects of Peter Stillman Sr.'s treatment of language as math with absolute meaning are far-reaching and severe and affect both himself and those closest to him. His "monstrous" treatment of his son ensures that his son will never be able to function properly in society (45). He spends years in jail being punished by society for so completely ignoring them and mistreating his son. He himself cannot function properly in society, as noted by Daniel Quinn when he follows Stillman's meanderings around the city as he picks up and intensely studies other people's discarded garbage. Finally, Stillman commits suicide by jumping off of the Brooklyn Bridge, a notable piece of news reported in all the local newspapers. Paul Auster highlights the problems that accompany viewing meaning in language as math by dramatizing and sensationalizing extreme, negative consequences that stem from such a view.

Auster also uses the character of Daniel Quinn to emphasize the negative consequences of mathematically treating the components of language as discrete, meaning-bearing units. As a detective writer, Quinn is used to adopting the persona of a detective, "one who looks, who listens . . . in search of the thought, the idea that will pull . . . things together and make sense of them" (15). In this search for sense, Quinn is burdened by the belief that life amounts to a good detective novel, and "in the good mystery there is nothing wasted, no sentence, no word that is not significant. And even if it is not significant, it has the potential to be so—which amounts to the same thing" (14). This then leads Quinn to believe that, "since everything seen or said, even the slightest, most trivial thing, can bear a connection to the outcome of the story, nothing must be overlooked" (15). This creates an obsession in Quinn to record every detail of Peter Stillman Sr.'s doings, convinced that the answers lie within every piece of evidence. This idea of every piece being vitally important applies quite well to a math equation, in which every number affects the answer, no matter how slightly, and no part may be left out. However, in language, this is not the case. A contemporary to Wittgenstein, philosopher of language W. V. O. Quine (quite possibly a namesake for Quinn) voiced his opinion that words and sentences can only find meaning in the larger context of the entire language, a fact which Quinn completely ignores (*From a Logical* 42–46). The holistic meaning of language must be considered to understand its parts; the gestalt is more important than the pieces that comprise it. However, Quinn continues to interpret words and actions as isolated entities, ignoring any larger context or interpretation that might allow him to solve his "case."

Quinn, like Peter Stillman Sr., also errs in his tendency to ignore society in his search for meaning. From the first chapter of the novel, Quinn's self-imposed social isolation is emphasized. The reader learns that "he had once been married, had once been a father, and that both his wife and son were now dead" (7). Quinn himself acknowledges that "he no longer had any friends," and throughout the novel, he remains emotionally isolated. Quinn is still able to navigate the social sphere, meeting new people and carrying out meaningful conversations, but he maintains an element of aloofness, most obviously by adopting the identity of Detective Paul Auster. However, by the novel's end, Quinn becomes completely socially dysfunctional. The ambiguous narrator acknowledges Quinn falling off the social radar by stating of Quinn's isolated stakeout, "We cannot say for certain what happened to Quinn during this period, for it is at this point in the story that he began to lose his grip" (173). Quinn spends months not talking to anyone, living in the alley outside of Peter Stillman Jr.'s empty apartment, ignoring all opinions of society. This isolation causes him to miss society's direct interpretation of his "case," after Peter Stillman Sr.'s suicide is reported in the newspapers as the final act of a desperate madman. In this isolation, he begins to lose his ability to transfer meaning with words, for, in W. V. O. Quine's words, "language is a social art" (*Word and Order* ix).

The consequences of Quinn's mathematical and isolative treatment of language are not as severe as Peter Stillman Sr.'s but are much more interesting. Daniel Quinn seems to personify what happens to a word which loses its pragmatic use in a language: it becomes meaningless and displaced. Quinn loses even the minor place he formerly held in society after his isolated stakeout. He returns to what he thought was his apartment to find all of his things gone and someone else occupying his previous living space. The apartment in no sense belongs to him anymore; the descriptors "resident" or "occupant" now apply more directly to someone else. He has no money to start a new life and, almost as if he has forgotten how to function, returns to the apartment of Peter Stillman Jr. to wear out his words in the red notebook before mysteriously disappearing for good. These tangible consequences of Quinn's philosophical belief underscores the importance of society in meaningful language to both Wittgenstein and Auster.

In their second meeting, Peter Stillman Sr. tells Daniel Quinn of a "prophet," a "man who spoke truths the world was not ready for": Lewis Carroll's representation of Humpty Dumpty. Peter Stillman Sr. does not go any deeper into the lore and philosophy of Carroll's character, but a closer look at Carroll's *Through*

the Looking Glass reveals an interesting conversation between Humpty Dumpty and Alice:

“When I use a word,” Humpty Dumpty said, in rather a scornful tone, “it means just what I choose it to mean—neither more nor less.”

“The question is,” said Alice, “whether you can make words mean so many different things.”

“The question is,” said Humpty Dumpty, “which is to be master.” (297)

In *City of Glass*, Auster confronts the same question: “Can man ever truly be the master of language?” Both Auster and Wittgenstein would seem to at once agree with and disagree with Humpty Dumpty, answering, “Collectively, man is certainly master; individually, he is certainly not.” Society as a whole determines meaning in language; philosophers of language shut up in offices or postmodern authors absorbed in notebooks can no more control the meaning of language or isolate its meaning-bearing parts than Peter Stillman Sr. could rename every item in the world and expect to communicate any meaning to others by using his new words. Auster’s exploration of language in *City of Glass* seems on the surface to keep the post-modern tradition of fretting about how language can mean what we intend it to, but ultimately supports Wittgenstein in his belief that “the aim of philosophy [of language] is to erect a wall at the point where language stops anyway” (*Philosophical Occasions* 187). Society as a whole gives its unspoken approval of language with every word spoken and conversation had, and although language does break down under mathematical pressure, it still manages to run the pragmatics of the world all on its own.

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