Language as System and Situation:

Writing the World

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Language as System

Language is obviously crucial to any discussion about writing. However, we there are two important ways to talk about language that should be clearly distinguished (Gee 2014; Levinson 2000). The first way we can talk about "language" is to name a language as a "system". Any language is a grammar of experience. The grammar or structure of the morphemes, words, phrases, and sentences in a language is a system that cuts up, regiments, and labels experience in certain ways. The system affords speakers of the language a certain way of looking at the world.

For example, Standard English uses auxiliary verbs and suffixes on verbs to distinguish between actions that are viewed as a completed point in time ("He washed his car") and actions that are viewed as ongoing in time ("He was washing his car"), though, of course, all actions take time to unfold. Some varieties of English spoken by some African-Americans make a third distinction (Gee 2015a). They use a "bare *be*" form to mean that an action is habitual or recurs regularly over time ("He be washing his car" = he washes his car all the time/he habitually washes his car). This example makes clear that even closely related dialects can map the world in different ways, though, of course, unrelated languages can display more dramatic variations.

It is not just languages and dialects that map the world as system differently, so do different registers or social languages, that is styles or varieties of language that are associated with particular identities, groups, institutions, or endeavors (Gee 2015a). The language of physics uses the word "work" differently than does vernacular English. The language of chemistry uses words like "heat" and "temperature" differently than does vernacular English. The language of video gamers is different than the language of doctors or gamblers. This is so because gamers,

doctors, and gamblers are interested in making different distinctions and dividing up categories in different ways than each other and than vernacular English.

Consider a difference like “Hornworms sure vary a lot in how well they grow” (in vernacular English) and “Hornworm growth exhibits a significant amount of variation” (in academic language of the sort associate with domains like biology). The former sentence, in the vernacular, asks us to see the world as made up of concrete things (like hornworms) and dynamic processes of change (like growing and varying). The latter academic sentence asks us to see the world as made up of abstract measurable variables like growth and variation. Furthermore, the former sentence is based on one’s own observation of hornworms and represents one’s opinion. The latter sentence is based on tests of significance owned by an academic field and represents a much more “anonymous” discipline-based claim than the former. Note then that “Hornworm growth sure exhibits a significant amount of variation” sounds odd. The affective/emotive term “sure” does not fit with “voice of reason and evidence” style of academic language. Each form of language gives us a different stance towards the world of experience. Hornworms come to mean and even, in a sense, be different things.

Language as system is a lot like a set of clothes. The sort of clothes we wear to the beach—what goes with what—are different than the sort of clothes we wear to a business office and this again is different on a casual Friday. Note that just as each different set of clothes is associated with a different identity, function, and context, so, too, with different dialects and styles of language (social languages).

The world can be cut up in different ways for different purposes by groups with different interests. For example, gamers distinguish among role-playing games, action games, adventure games, strategy games, and platformers, among others. Games have many different features and the world of games could be cut up in many different ways. How we cut them up into categories is determined by the words we have and the words we have are determined by the efforts and interests of groups to which we belong. We could imagine other interests categorizing games as games with avatars, games without avatars, games with stories, games without stories, games with first or third person perspective versus "god games" (with a god's eye view of the world). These are two different systems and the latter will only exist if and when some group has things they need to do and people they need to be that would render this system useful and important to them.

Some linguists use the term "utterance type meaning" for the system level meanings to which grammar gives rise (Levinson 2000). At the "type" level "cat" means a feline animal and is part of sets of related terms like "pets", "domesticated animals", "small animals", and so forth. At the "utterance token meaning" level a word like "cat" can take on quite specific and even novel meanings in specific contexts of use. For example, if we are staring at a cloud shaped like a cat and I say "The cat is moving a way", the word "cat" means a cat-shaped cloud. It is to the issue of utterance token meanings that I now turn.

Language as Situated

The second important way we can talk about language is as situated within contexts of use (Gee 2004; Clark 1989). At a system level some varieties of English distinguish among things like coffee, tea, soda, juice, water, beer, and wine as drinks (for example, this is a list I could offer you as a guest when I ask you if you want something to drink). However, when we actually use these words they can take on different meanings in different contexts. If I say, "The coffee spilled, go get a mop" I mean coffee as liquid; if I say "The coffee spilled, go get a broom" I mean coffee as grains; if I say "The coffee spilled, stack it again" I mean coffee as tins; and if I say "The coffee spilled, scoop it up", I mean coffee as coffee ice-cream. In fact I can say something as novel as "Big Coffee is as bad as Big Oil" and you know how to situate the meaning of "Big Coffee" based on all the contexts in which you have heard or uses "Big Oil". If I was asking a food bank if they wanted me to donate coffee, tea, soda, juice, water, beer, or wine, the list of terms would no longer name drinks but rather cans and bottles and those "in the know" would know that adding beer and wine is probably a joke in this context.

Consider that a sentence like "Any society with thorough-going restrictions on economic freedom could not be a democracy" at the system level seems to be nonsense. "Democracy" at the system level just means voting or voting for representatives who vote. What could possibly stop any society from voting for any economic restrictions they wished? Yet this sentence expresses a central claim of the sort of neo-liberal economics championed by the late Milton Freedman. You can only assign a situated meaning to "democracy" here if you know Freedman's theories and those of his followers (Gee 2015a). Once you know this context, the use of the word is no longer nonsense, though the theory may, of course, be false or true.

Notice that the distinction between system and situation is not one of acultural versus cultural. Some social groups of English speakers use "coffee, tea, juice, soda, water, beer, or wine" as a systematic set of "common drinks" and of options to offer guests as drinks on social occasions. Some groups have other sets of terms and drinks. Some social groups are interested in distinguishing films and video games by appropriate ages for play and in terms of violent or non-violent, sexually suggestive or not, and other such distinctions. These are the categories they have. Gamers are not all that interested in such categories (unless they are playing their parent role), but are interested in a different set of categories. Both systems and situations can vary by social group and culture.

A Chicken and Egg Paradox

Which comes first, system or situation? We only know what "coffee" means fully when we have experienced a range of situated meanings the word can have and can even make up new situated meanings for it as contexts or cultures change. But we can only situate the meanings of words we have in our language or in a given social language and in terms of how these words relate to the other words and to the syntax of that language or social language.

Turning to structures, rather than just words: while the subjects of sentences in English are always "topic-like" (this is their general system meaning), in different situations of use subjects take on a range of more specific meanings. If, in a debate, I say, "The constitution only protects the rich", the subject of the sentence ("the constitution") is an entity about which a claim is being made; if a friend of yours has just arrived and I usher her in saying "Mary's here", the

subject of the sentence ("Mary") is a center of interest or attention; and in a situation where I am commiserating with a friend and say something like "You really got cheated by that guy", the subject of the sentence ("you") is a center of empathy (signaled also by the fact that the normal subject of the active version of the sentence—"That guy really cheated you"—has been "demoted" from subject position through use of the "get-passive"). Which comes first, subjects as topics (their meaning or function in the system) or the range of situated meanings topics can have in contexts of use?

Clothes work the same as language here again. Wearing a black suit as a system of coordinated shirt, pants, jacket, tie, and shoes (all of which must be black or go with black) always connotes "formal". But it means a different thing at a business office than it does at a funeral than it does when worn by a college teacher (who is either of an earlier generation or teaches something like business) than it does when worn by a minister (who is, thus, not a Catholic priest). Which comes first, black suits and the system of coordinating and contrasting sorts of clothes into which they fit or the range of meanings a black suit can (and cannot) have?

Language as system regiments and categorizes reality and renders its recognizable (Vygotsky 1987). Language as situated uses experiences in the world to give language a range of meanings without which, of course, there would be no meanings at all. Language gets meaning from experience (it has to mean something when it is used) and yet it organizes the very experience that gives it meaning. Which come first? Neither, they bootstrap each other into existence.

Imagine a whole new genre of video game is invented. We could now apply one of our current system labels to this new genre and, thus, widen the range of situated meanings that existing label can have. Or we could create a new label or a new sub-category of an old label and thereby change the system, since now all the old labels have a new label to comport with in the system. In these ways language as both system and situation evolves.

The same is true of clothes again: those socks with toes are called "toe-socks" (a new sub-category), though we could have called them "foot gloves". On the other hand, for some people, given the modern debates around abortion, and the new abilities of medicine to keep premature babies alive, the word "human" has been given a new situated meaning in terms of which even a very early fetus is now a "human" and "life" begins at conception (but note no one, I think, would say a fertilized egg is a chicken). This latter example makes it clear that how system relates to situation and how they evolve as things change can be quite consequential, even the heart and soul of what constitutes civil society and creates or resolves cultural divides.

Language, Experience, and Learning

So we have concluded that language gets meaning (situated meaning) from experience and experience gets meaning (system meaning, i.e., gets categorized and regimented by) language. So what are the implications of all this for teaching and learning? The implications start here: Humans learn from experience. It used to be believed that the human mind works much like a digital computer (Pylyshyn 1984). Humans, like computers, were thought to learn and think through calculation, abstraction, symbols, and generalities. But in fact humans tend to be bad at what digital computers are good at and good at what they are bad at—that's why we have them.

Computers are good at keeping budgets, bad at face recognition. Humans are often poor with keeping their checkbooks straight but unbelievably good at face recognition. A newer theory of mind—based around situated or embodied cognition—argues that humans are pattern recognizers par excellence (Barsalou 1999a, b; Bergin 2012; Glenberg 1997; Glenberg & Robertson 1999; Glenberg & Gallese 2012)). Humans have experiences in the world, they store all these in their long-term memories (which are, unlike a digital computer, nearly limitless), and they use these stored memories to search for patterns and sub-patterns that will help them prepare for action in new experiences.

None of this means that humans cannot abstract and generalize. What it means is that humans often do so bottom-up (diSessa 2000). They start with experience and with concrete understandings and as they gain more experience they find ever more generalizable patterns and eventually gain more general knowledge. Humans cannot learn well from texts until they have experienced how the sorts of words and grammar of the social language in the text translate into experience, that is, unless they can associate the words of the text with images, actions, goals, and dialogue (i.e., situated meanings). Once they have experienced situated meanings in a variety of relevant contexts, they are ready to learn by reading and hearing larger blocks of language out of context—but only then.

Humans can use their stored experiences to run role-playing simulations in their minds to prepare for action (Gee & Hayes 2011). For example, if you want to prepare for a toast you have to give at a friend's wedding you can role play various scenarios—even role play the reactions of different people at the event—to make a decision about what to do and what not to. You will use

experiences you have had, but also ones you have heard about or seen, for example in movies, to do this (humans do not strongly distinguish between experiences they have had in the world and the ones they have had via media, Reeves & Nass 1999).

But experiences are best for human learning when they have certain key features. Let me define a new term, "experince^{GL}" meaning" experience that is good for learning". An experience^{GL} has these features (Clark 1997; Gee 2004, 2013; Glenberg 1997; Wason 1966, 1968):

1. A learner has an action to take and a clear goal

2. The learner cares about the outcome of the action—something is at stake for the learner in the outcome of an action

3. A learner knows how to appreciate (judge, assess) the outcomes of various attempts to succeed towards his or her goal and knows how to go on (what sort of thing to try next) after a failed attempt

3. The learner can manage his or her attention in the experience—know what to pay attention to, what to focus on and what to background—so as to avoid cognitive overload (always a danger in experience and in multi-modal media, as well, where there are a wealth of things that could be paid attention to)

Now here is where teachers and teaching come into the picture (Hattie & Yates 2013). Beginners cannot do these things for themselves. They need help formulating goals (and knowing when in a course of action to rethink or reformulate them). They need help judging what are good or promising outcomes and what are not in their trajectory of attempts towards a goal. They need help knowing how to go on, help with what are good choices about what to do next. They need help managing their attentional economy, help with where and how to pay attention, what to focus on, what elements to foreground and background in the experience.

When some "teacher" (parent, school teacher, peer, media or technology) offers these sorts of help, they have designed the experience for the learner. They have created a well-designed experience for learning. All learners need well-designed experiences for learning. Beginners need teachers and deliberate learners are people who have learned to teach themselves and design their own experiences.

Good Teaching

Good teaching is a form of design, designing well-designed experiences for learning. But what has this got to do with our earlier discussion of language as system and language as situated? Let me explicate this through an example. Consider the quote below:

> … yet I believe [Milton] Friedman is right that thoroughgoing restrictions on economic freedom would turn out to be inconsistent with **democracy** (http://www.becker-posner-blog.com/archives/2006/11/on_milton_fried.html).

If you do not understand this quote, how would I teach you to understand it? Well you would have to understand the sorts of economic language the "Chicago School Economics" (founded by Friedman) used and many neo-liberal economists still use today; you would have to understand their words and the ways in which their words set up sets of categories. You would have understand the way they recruit grammatical resources to order sentences and texts and, thereby, order experience (what counts as foregrounded and backgrounded, what is asserted and assumed, what is easily sayable and what is not). But how could you understand this system if you have had no experience with how these people talk and write, act and value in the world? But, then, how can you even make sense of this experience if you do not already know how these people divide experiece up in terms of their system?

This is our chicken and egg paradox again. We have to learn a system through well-designed experiences in the world and we cannot make sense of experience without the very system we are trying to learn. To show how good teaching can defeat this paradox I need now to turn to an example that will not require me to bore you with neo-liberal economic theories.

An Example of Good Teaching

Yu-Gi-Oh is a card came on the order of *Magic the Gathering* or *Hearthstone*. *Yu-Gi-Oh* can be played face-to-face or in video games. The game has thousands of cards. Players select from these 40 cards to make decks with cards that allow certain sorts of tactics and strategies in the game. *Yu-Gi-Oh* is played by players from 7 years old on up to people in their 30s and beyond. Each card contains a picture and print that tells the player what the card is and what the character on the card enables the player to do in the game.

The language on the cards is quite technical and complex. Here is a typical example:

> **Cyber Raider**
>
> **Card-Type:** Effect Monster
>
> **Attribute:** Dark | **Level:** 4
>
> **Type:** Machine
>
> **ATK:** 1400 | **DEF:** 1000
>
> **Description:** When this card is Summoned: Activate 1 of these effects.
>
> Target 1 Equip Card equipped to a monster on the field; destroy that target.
>
> Target 1 Equip Card equipped to a monster on the field; equip that target to this card.

Players can turn to rule books on the Internet and fan sites to check on disputes about the rules or the proper interpretation of the words on a card. Here is an example of the sort of thing they will see:

> In order to Synchro Summon a Synchro Monster, you need 1 Tuner (look for "Tuner" next to its Type). The Tuner Monster and other face-up monsters you use for the Synchro Summon are called Synchro Material Monsters. The sum of their Levels is the Level of Synchro Monster you can Summon.
>
> http://www.yugioh-card.com/lat-am/rulebook/YGO_RuleBook_EN-v8.pdf

So *Yu-Gi-Oh* uses a particular social language. The examples above are language as system with a vengeance for you if you have never played the game. Without experiences of how things work in game play you do not know what meanings to assign to these words, but without knowing what the words mean in the *Yu-Gi-Oh* social language you do not know what to pay attention to in the experience. So how does Yu-Gi-Oh resolve this paradox through good teaching—and they must or they will go broke, since they are not a school, but a for-profit business (and they, indeed, make massive profits)?

Yu-Gi-Oh creates what I will call a Situated Learning System for teaching (Gee 2004; Gee & Hayes 2011). The system has the following properties:

1. **Game gives language situated meaning**

   In the game players use movements and dialogue to place cards out in front of them in ways that act out the meanings of the term. Players come to associate the terms of *Yu-Gi-Oh* language with images, actions, dialogues, goals, tactics, and strategies.

2. **Rule book and websites give language system meaning**

   At the same time rule books and websites exist as repositories of the *Yu-Gi-Oh* language as a social language and as language as system. Players can consult these texts as they are ready and need to.

3. Affinity spaces create diverse learning

Yu-Gi-Oh—like many other popular culture activities—is associated with a myriad of interest-driven fan sites ("affinity spaces", see Gee & Hayes 2010) where players of all ages, abilities, and social groups come together based on their passion for *Yu-Gi-Oh* and mentor and resource each other via a wide variety of activities ranging from didactic tutorials to models of good play and coaching of all sorts.

4. Convergent media

Yu-Gi-Oh puts out books, video games, television shows, movies, and websites that show dramatic stories of *Yu-Gi-Oh* characters (the characters on the cards) acting out the moves in the game, the move described in the *Yu-Gi-Oh* language on the cards and in the rule books.

5. Attentional economy

Video game versions of Yu-Gi-Oh in their early more tutorial like levels or play with other players who are acting as teachers actively help newcomers know what to pay attention to and how to manage one's attention effectively. They often do this by simplifying the game at first so newcomers have few variables—but important ones—to pay attention to.

6. Low cost of failure

Like many video games, the cost of failure is relatively low in Yu-Gi-Oh. If you lose you play again. Game sites can help match you to players at your level and video game versions of the game match you other comparable players who could be real people or computer run players. A lowered cost for failure encourages exploration, risk taking, and trying new things. It teaches players to view failure not as a judgment but as a tool for learning.

7. Manage complexity

Video games—including *Yu-Gi-Oh* in its video game forms—are designed in terms of levels which introduce and manage complexity for learners. Games introduce problems in a generative order where earlier problems lead learners to hypotheses and solutions that work well later as players use them with other tools to solve hard problems.

8. Language just-in-time & on-demand

Language as system is given "just in time", that is a small block that the learner can see in application, or "on demand", that is, larger blocks of information out of context when the learner is ready for them, asks for them, and make good use of them (that is, use them as a resource). Note that each card has a small amount of "just in time" language the player uses and sees in application immediately in the game. The rule books and websites contain language best used "on demand" and as part of out of the game set of interactions and discussions.

9. Does not use time as measure of learning

Like most digitally inspired learning out of school and connected to interests and passions, *Yu-Gi-Oh* does not judge progress and measure learning by time. If one player takes longer or needs more time because of a lack of background knowledge or preparation, it makes no difference. What matters is that the player sticks to it, persists past failure, and moves towards mastery. If another player beats you, you cannot claim you are better because you learned aspects of *Yu-Gi-Oh* faster than the other player.

10. Modding & Production

Today video games are part of larger Maker Movement in which people young and old can produce and not just consume (Andersen 2012; Hitt 2013). Without or without credentials people can become experts at media productions, design, news, citizen science, activism, technological innovation, and content expertise in any domain from physics to gardening. Gamers often "mod" games, that is, they use software to modify games or to create entirely new ones. *Yu-Gi-Oh* players can design cards, write fan fiction or game guides, and design tutorials for others.

11. Assess Growth

Digital media and affinity spaces allow for the collection of copious data. This data can be mined to assess players on multiple variables and in terms of growth across time and in terms of different trajectories towards mastery in comparison to

> thousands of other players. Such information can be used by players to improve, to evaluate their standing, or to inform other people or the Yu-Gi-Oh company itself about how best to resource players for development and engagement. There are no "drop out of the sky" one-off tests with a single score. Furthermore, because play is social, affinity spaces offer models of excellence and allow everyone to share high standards set indigenously by social groups engaged in collective learning and play.

Writing the World

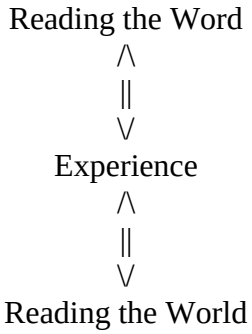
What is the moral of this story about *Yu-Gi-Oh*? It is not that *Yu-Gi-Oh* is special. In fact, there are lots of similar, perhaps even better (e.g., *Minecraft*), examples I could have given. The moral is this: Think of teaching as designing and resourcing a *learning system* with moving parts, just as the *Yu-Gi-Oh* company and *Yu-Gi-Oh* players do. The sort of learning system I have just sketched is very different from many of today's school and college classrooms. However, such systems are flourishing out of school and are giving rise to 21st Century skills and forms of collaboration and collective intelligence that are not even on offer in many schools and colleges.

Paulo Freire (1995) famously argued that reading the world must precede reading the word. He meant this as a call to reform and liberation. However, his claim is also simply empirically true. The cognitive capacities we use to comprehend and understand things in the world, oral language, and written language are one and the same (Biemiller 2003; Gee 2015b; Stanovich 2000). A person cannot comprehend texts well unless they can also comprehend oral languages

and states of affairs in the world well. And, we have also argued here that situated meanings—understanding how words and linguistic structures attach to images, actions, goals, and dialogue in the world (or virtual worlds)—are crucial for learning language as system, for understanding how and why language as system divides up the world as it does. For any text—whether a physics text or one about games or gardening—learners must live in and muck around in the world the language of the text is about, so that when they turn to the text they have enough situated understanding to begin sorting how the language of the text works as a sort of guide to that world.

One of the first things I learned when, in my mid-fifties, I began to game is that a game manual is pretty worthless unless and until you have played the game for a while. The game world and the actions you as a player in the game are what the manual is about and what ultimately allows players to understand in ways that make sense and inform future learning and actions. In many respects, giving learners a physics textbook without letting them "play" the "game" of physics (engage in physics as a set of problems to solve, tools and practices to solve them, and interactions with others) is a good deal like giving a kid a manual with no game. This a happy child does not make.

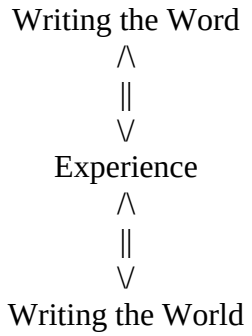
So, following Freire and our discussion here we see that it is experiences well designed for learning that mediate between reading the world and reading the word:



But Freire went even further:

> In a way, however, we can go further and say that reading the word is not preceded merely by reading the world, but by a certain form of writing it or rewriting it, that is, of transforming it by means of conscious, practical work (Freire & Macedo, 1987: p. 35).

So we need to add:



Above I pointed out that today we live amidst a Maker Movement. People can use digital tools of all sorts, the Internet, and affinity spaces to learn to make almost anything, to become experts

without degrees, and to work with others to participate and produce change with the need of any formal institution. Writing has always been the maker movement part of literacy. While we have long had societies where nearly everyone can read, we have never had societies where writing was anywhere near as pervasive.

So how does writing work in a Maker Movement age, in an age where people can make media, robots, scientific discoveries, art, news, social change, and new knowledge? I would suggest that writing needs to be seen as a maker tool along with other maker tools in the sorts of learning systems with moveable parts we discussed. Such systems are ultimately ways to teach people to play a certain sort of "game", to join with others to solve problems. In this respect we might see (and teach) writing as ways of making a moves in a consequential game in tandem with other tools and other people.

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