MIND, MORALITY AND MAGIC

Mind, Morality and Magic

Cognitive Science Approaches in Biblical Studies

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ACUMEN

Chapter 7

"I WAS EL SHADDAI, BUT NOW I'M YAHWEH": GOD NAMES AND THE INFORMATIONAL DYNAMICS OF BIBLICAL TEXTS

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THE INFORMATIONAL DYNAMICS OF JUDAIC TEXTS

This essay addresses the nature of information in Judaic texts, focusing particularly on the written names of God. I argue that these names are the main instrument through which information is organized in Judaic systems.[1] Names are a difficult subject in the philosophy of language because they work differently than other features of language; they tend to capture information that is much more specific than other types of language. Names are bound to specific "experiences," "baptisms" in space and time, referring to unique persons and places. When names are written they take on different properties than verbalized names because their physical form, not their sound, persists in time.

Cognitive science gives us some valuable insights on the nature of naming in human and other biological worlds. Instead of confining these insights to previous cognitive approaches to religion, my work instead seeks to integrate research in cognitive science and related fields into the study of religion in ways that can be relevant to humanist scholars of religion. This puts me in a difficult, between rock and hard place, position.

Cognitive scientists of religion have a scientific agenda in their attempts to explain religion, though they often misrepresent just how much we know about the human mind/brain and the uncertainty at the heart of

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1. Neusner (2004: 9–10) defines a Judaic system as having three primary characteristics: (1) "a worldview, by reference to the intersection of the supernatural and the natural worlds, accounts for how things are and puts them together into a cogent and harmonious picture"; (2) "a way of life which expresses in concrete actions the worldview which is explained by that worldview"; and (3) "a social group calling itself, 'Israel' for which the worldview accounts, which is defined in concrete terms by the way of life, and which, therefore, gives expression in the everyday world to the worldview and is defined as an entity by that way of life."

modern scientific projects. I am not suggesting that the uncertainty is a bad thing, quite the contrary, science is based on potential falsification and *not* being certain about its basic theories. I think this is what makes it a better method for both explanation and understanding than many positivist positions in the humanities (such as historical positivism). So, on the one hand, cognitive scientists of religion expect one to make falsifiable, empirically tractable statements that operationalize one or another of the going popular or well-financed theories (whether Whitehouse's, Boyer and Liénard's, or McCauley and Lawson's; see Chapter 1 of this volume). That's OK, but it is not what I am doing.

Humanist scholars in Jewish studies and biblical studies, on the other hand, heavily conditioned by postmodern fears of science, desperate to guard their own particular slice of territory, and suspicious of biological approaches to culture, are often reticent to accept anything derived from cognitive science. As the editors have noted in Chapter 1 of this volume, perhaps there is an important middle ground some of us find useful. I advocate a hybrid, moderating, field between humanities and cognitive science. It is not pseudo-science because the science behind my statements is far from 'pseudo'. It is also not pseudo-science because it is not *science*. Scholars in biblical studies and Jewish studies simply need to be less uptight. Eventually I am confident this will happen when the old guard retire. But for now I think we should push on.

My main example from Judaic texts comes from Exodus 6:3, a verse which makes claims about superhuman agent names, the manner in which they are known, and how they have changed over time. The verse exemplifies the so-called double subject construction where "the verb agrees with the noun's possessor," a form attested elsewhere in the Hebrew Bible that grammatically emphasizes unity and identity between tools, or other extensions such as body parts, and actors (in this case God and his name). The equation of a superhuman agent with his name represents an early manifestation of religious beliefs and practices common in later Judaic systems where the name of God was never spoken, and was replaced by various euphemisms such as "Adonai" or "HaShem." When the name was written, its sacrality was believed to be transferred to the material on which it was written, a phenomenon attested in the oldest "Biblical" inscriptions, the silver scroll amulets found in the Hinnom Valley in Jerusalem (more about this later).

In the book *Rule of Experts*, Timothy Mitchell (2002) traces the processes of modernization in Egypt since the beginning of the nineteenth century. In doing so he astutely interweaves the complex interplay between economic management, ecological exploitation, and human agency. For example, he notes that there were two invasions of Egypt at the beginning of the twentieth century, one an army of men, the other an army of mosquitoes. One of Mitchell's most convincing points in the book is that

history, especially economic history, far too often assumes there is only one player, or form of agency, on the historical scene, and one direction of causation, from human beings to the world. Most histories take no notice of the multiplicities of agency present in the non-human world that bear on human history, such as technology (the building of dams), non-human animals (mosquitoes), weather, and other such phenomena.

I think literacy plays such role as well. More to my points to come in this essay, Mitchell's arguments indicate that the properties of objects in the world and their interactions are not just passive symptoms of human behavior, but directly influence and condition that behavior. Under this radically pluralistic model of historical causality we might draw parallels between this idea and a more precise idea in the cognitive science of culture, Tomasello's notion of the *affordances of artifacts*.[2] I argue writing can be understood in such a way, especially writing in Judaic systems.

For Tomasello, one of the most important things children learn about objects in their early development is their affordances. That is, they learn how an object's unique physical properties are themselves conducive to certain ways of acting on the world. Objects are not inert, passive, substances, but part of human cognition (Turkle 2007). In addition to "natural sensory-motor affordances" children (and adults) will gradually also develop "intentional affordances based on her understanding of the intentional relations that other persons have with the object or artifact" (Tomasello 1999: 84).

This essay unites Tomasello's notion with Andy Clark's argument that both spoken and written language work because they are *material* symbols, and attempts to apply this integration to the role of written language, in particular, names of God, in early Judaic systems. Scholars have often failed to notice something "Jewish mystics" probably understood well: that written letters (and spoken letters, as we shall see) are, in fact, physical artifacts, having affordances, and perhaps playing a more active role in history in the manner Mitchell describes.

This is somewhat of an old argument in new clothes. The old argument is that Biblical narratives are "good to think with." The new clothes are the theoretical and empirical resources of cognitive science and the philosophy of language. I think some of the most profound work in the cognitive sciences concerns the role that the brain and body play in the development, production, and reception of language and memory. In what follows I argue that names activate a more primitive, biologically more basic network within the brain and that this is partly where they get their "numinous" or magical power. I will the see how far the cognitive account of names gets us with regard to their use in Judaic systems.

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2. Tomasello gives some credit to Gibson (1979) for the notion; see Tomasello (1999: 84).

EL SHADDAI AND YAHWEH

A well-known, but particularly elusive biblical passage is Exodwus 6:3. It tells us a great deal about the way Judaic systems deal with names. It reads:[3]

וָאֵרָא אֶל־אַבְרָהָם אֶל־יִצְחָק וְאֶל־יַעֲקֹב בְּאֵל שַׁדָּי וּשְׁמִי יְהוָה לֹא נוֹדַעְתִּי לָהֶם׃
Biblical Hebraica Stuttgartensia (BHS)

> "I appeared to Abraham, Isaac, and Jacob as *El Shaddai*, for I, my name *Yahweh*, was unknown to them."

W. Randall Garr points out some interesting grammatical features of this passage. By juxtaposing these names with one another, the Priestly writer "bridges the religious history of the patriarchal and Mosaic ages" (Garr 1992: 386). Garr argues that the prepositional phrase in the first half of the verse is governed by the "partitive *beth*"—a construction that offers a limiting or partial view of the entity in question, namely the "I" which is the subject of both verses; whereas in the second half, the verb is governed by the so-called "double subject construction" where "the verb agrees with the possessive suffix of the noun, not with the nominal itself" (*ibid.*: 389). The relation here between the name, שם, and יהוה (Yahweh) is that of part to whole, where the part does not act independently of the whole but is, in effect, the performer of the action. We may say then, that the part serves as a tool for the whole. For example, body parts follow this grammatical form in some passages such as Psalms 44:3: אַתָּה יָדְךָ גּוֹיִם הוֹרַשְׁתָּ—"You, your hand, dispossessed nations." So in the case of Exodus 6:3b, we have "for I, my name Yahweh, was not known to them."

Garr notes five possible characteristics of the double subject grammatical construction based on comparison with other passages such as Psalms 108:2, Psalms 57:5, Isaiah 26:9; 1 Kings 15:23, Genesis 17:24 and others: first, the noun and possessor exhibit "an inseparable part-whole relationship" where the noun is a body part, feature, property, or abstract representation of the whole; second, the part specifies the location or extent of the possessor's involvement; third, they function alike; fourth, the possessive pronoun cross-references the whole; fifth, the possessor is the subject of the verb and agrees with it. In terms of its discourse effects, Garr finds two further common functions: first, the part and whole are identified with one another, differing only in extent of involvement where the part "acts as the vehicle through which the whole is involved in a situation;" and second, the whole is usually more topical (or relevant) than the part (Garr 1992: 394).

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3. Hebrew texts in this essay are cited in the author's translation unless otherwise indicated.

Garr goes on to point out that the strict apposition between ימשו (name) and הוהי (Yahweh) suggests that these appositional nominals "are either equireferential or identical," and he comes down in favor of the latter, basing his interpretation on other passages in the Bible where "God's 'name' is frequently synonymous with 'Yahweh'… and God himself" (*ibid*.: 396). For example, we find this form in Deuteronomy 28:58, Isaiah 24:15, and Psalms 5:12. I would also add to this usage the hypostasized name Hashem, as found, for example in Leviticus 24:11, which comes to great use in later Judaic systems.

וַיִּקֹּ֛ב בֶּן־הָאִשָּׁ֥ה הַיִּשְׂרְאֵלִ֖ית אֶת־הַשֵּׁ֑ם

BHS

"The Israelite woman's son desecrated The Name."

Thus, in Exodus 6:3b, *Yahweh* is "not only the content of God's 'name,' but 'Yahweh' is God himself" (Garr 1992: 397). So while the first part of the verse points to a limited equivalence, one of equi-referentiality, the latter part marks a complete equivalence, one of identity, at the same time that it privileges the whole above the part. This is not only a grammatical point, but also a historical one that the writer of this verse would have been aware. The two constructions have opposite function and serve to contrast the two divine names.

A useful distinction in the philosophy or language and cognitive linguistics that may help us make sense of this is what is called the type-token distinction.[4] The Biblical conception of names appears to be a purposeful confusion of the distinction between type and token with regard to names.

This distinction is somewhat loose because a type is simply one level of emergence "above" a token. In other words, there are no absolute tokens or types—a type can serve as a token for higher order types. In general, a token is considered an instantiation of a type. That is, the token is a physical particular instance of a type. The example frequently given is the line from Gertrude Stein's poem *Sacred Emily*: "Rose is a rose is a rose is a rose" (Stein 1922).[5] There are three types of words in this sentence, and 10 tokens

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4. The discussion about types and tokens is quite common in neuroscience. In terms of brain structure types are more complex bundles of neurons than tokens. Types are more "abstract" relational networks than tokens. I favor the view known as token-identity, the idea that mental and physical tokens, rather than their types, are identical. For more on the relation between types and tokens in cognitive science and how cognitive technologies can reorganize the relation, see my discussion in Levy (2010, 2011).

5. Interestingly, in that poem from 1922 the first word "Rose" was actually a name, probably referring to Jack Rose. The phrase is an obvious allusion to Shakespeare's line from Juliet in *Romeo and Juliet*: "What's in a name? That which we call a rose/By any

of words. Types are abstract while tokens are composed of ink, pixels of light on a computer screen, smoke signals, sound waves, and so on (Wetzel 2008; see Table 7.1).

Table 7.1 Types and tokens.

Types		Tokens	
1	Rose	1	Rose
2	is	2	is
3	a	3	a
		4	rose
		5	is
		6	a
		7	rose
		8	is
		9	a
		10	rose

The details of the relation between tokens and types are controversial. I bring it up not to add confusion but to say something specific about the organization of names in language and the brain. Furthermore, this allows the useful point that in Judaic systems tokens of God's name are in some sense identical with the type. In other words, Judaic theology does not make as much of the modern distinction between the word for God as it is physically instantiated and God. That is, the physical marks of ink retain their identity with God, holding power through associative and metonymic forms of magic (for more on these forms of magic, see Chapter 1 of this volume, and Rozin & Nemeroff 1990).

For biblical minds, the relation between the written token of God's name and God is analogical and not digital; the relationship is token-token, not token-type. In other words, each time the name of God is written, God is embedded in the writing act. This is why sacred texts have to be treated so carefully. Or rather, what makes the text sacred is that they contain God's name. To make it clear, then:

<div dir="rtl">הוהי א הוהי א הוהי א הוהי א הוהי א הוהי א הוהי א הוהי א הוהי</div>

In this example we have seven tokens of God's name, but there is no more general concept, no level of abstraction "up," there is no general concept הוהי that could correspond to a type. In ancient texts these tokens were often specially tagged or 'marked-up' by using archaic forms of the letters,

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other name would smell as sweet ..." For the full text of the Stein poem, see www.questia.com/PM.qst?a=o&d=6082895.

as in the Qumran Psalms Scroll (see Levy 2012: 101 for the image). But these issues of reference, naming, and identity get into some rough conceptual waters. The priestly reflections captured in the grammar of the sixth book of Exodus are reflections on the name of God in what might be seen as the long tradition of Judaic reflection on the name. What do the tools of cognitive science offer us in understanding this verse? I attempt to lay out a groundwork to answer this question.

WRITTEN NAMES

Names have long been regarded by philosophers as a distinctive form of language. The gist of the difference concerns the notion of reference; that is, there is something about names that gets to the heart of the more general problem of reference. Proper names are thought to refer to unique individuals. That is, unique, physical individuals are thought to provide the semantic or informational content of names. We may speak of all words, all nouns especially, in some sense as "names," but in this essay I restrict my account of names to what we call "proper nouns" or "proper names." These types of nouns tend to border on the systematic semantic dimensions of communication—that is, the way that meaning emerges out of a dense semantic web—at the same time that they defy it in their referential uniqueness. But, of course, the point is debated among philosophers just how distinct names are from other types of nouns, and whether we need a theory of names at all to account for them.

The philosophical account of names goes as far back as philosophy and theology themselves, for a discussion of the names of gods is where any particular theology must start. The cognitive science of religion tends to see names of gods as immediately transparent and in doing so cannot account for the semantic content of names, which is fundamentally normative and historically contingent (Salmon 2000). I find this ironic; in its inadequate theorizing of the role of names in religion the cognitive science of religion evades such an important part of religion. Further, by invoking the names of gods in transparent ways ("we know what Buddha, God, Jesus refers to") the cognitive science of religion accidentally imports theological baggage. To solve this problem scholars need to acquaint themselves better with the debates over meaning and reference (Benor 1995).

My own interest in the philosophical account is purely a means to an end—the end being a successful materialist account of names and naming in Judaic systems—that is, how the act of naming is instantiated in the brain and body, how names are stored internally and externally, and how they are retrieved and produced at the level of integrated physiology. This would not be the whole story, but it would be a good part of it. Names are the primary way we search for relevance in search engines like Google

or in *The Bible Code*; in other words, names are a great way to organize attention. Names carry something unique about very particular moments in time and space at the same time that they tend to strike emotionally relevant chords.[6]

The earliest Biblical texts are found inscribed in amulets found at Ketef Hinnom, which Schniedewind (2004) dates to the seventh century BCE. Schniedewind rightly notes that these amulets are an "early expression of the later practice of" using *tefillin*, and seem to be attempts "to carry out the injunction of the *Shema*" in Deuteronomy 6:8-9 (*ibid.*: 106). In both these texts we do indeed find the personal name of God, Yahweh: in the first case a fragment of the Priestly blessing in Numbers 6:24-6, and in the second case a fragment of Deuteronomy 7:9-10.

Out of about twenty-five or so remnant words in the first amulet, four of them are the divine name. On the second amulet, out of about fifteen or so remnant words, three are the divine name. Without forgetting the fact that names almost always come in the context of sentences and paragraphs, to my mind these verses seem to be almost entirely about the name, a mantra-like reinscription of the divine name, and this is perhaps where they get their "numinous power" (Schniedewind 2004: 24).
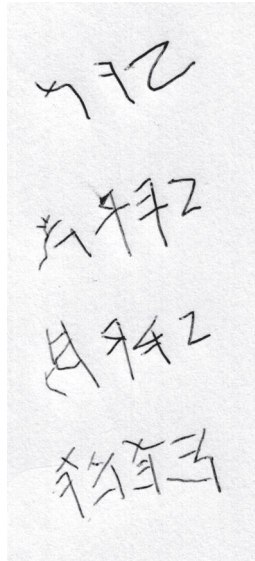

Figure 7.1 Divine name from lines 1, 12, 15, and 17 of Amulet I from Ketef Hinnom.

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6. Especially when hearing our own name, see the *cocktail party phenomenon*. This fact also explains the basic technique of self-help books such as the classic *How to Win Friends and Influence People*, written in 1936, in which Dale Carnegie wrote of the importance of using people's names in the hopes of influencing and "winning."

As would be expected, the name Yahweh itself appears far more commonly, at least 48 times (1.2%), in Hebrew inscriptions, than in other types of inscription. The Khirbet Beit Lei and Naveh inscriptions both stand out in terms of the number of hits and their proportion in the location's corpus. The name appears about 567 times in Qumran (0.2%), and 6828 times in BHS (1.5%), with severe spikes in terms of hits per thousand words in the prophetic literature. Aside from divine names, there appears to be a relative abundance of *proper* names in general in Hebrew inscriptions. Out of 3968 total words there are 855 names, roughly 21.5 percent of the words are names—as opposed to the 9.8 percent for Northwest Semitic inscriptions (801/8209; 9.75%), 2.2 percent for non-Biblical Qumran sources (5710/261,411; 2.2%) and 8.5 percent for BHS (36,285/426,835; 8.5%).[7]

I find that the relative abundance of names in general, and the names of God in the inscriptions especially, indicate that these features of the world do something far more interesting than can be captured in the word "magic." Schniedewind invokes these inscriptions to make some very convincing points about the effect of literacy on early Judaic systems. But aside from some pretty casual references to Goody's work on literacy, Schniedewind gives us little explanation for this perception about writing in general and writing names in particular. Writing a divine name is magical, but how so?

WRITING RITUALS

I would briefly like to note four examples of rituals that may provide some religious background to understanding the role that written words play in Judaic systems. This should give us some insight into the ritual practices involved in writing and interacting with names in these systems.

Encouragement in the wearing of *tefillin* is one of the central reaching-out techniques of the Lubavitch "mitzvah tanks"—the idea is that all you have to do is get a Jew to put on the *tefillin* and his Judaic soul will be rekindled. One is literally binding the texts, and by extension the name of God, onto his arm. This aspect of being able to touch the text, by extension the name—is what makes writing so powerful. So it is the extensional feature of spoken and written language—the fact that it is materially present in the world, and then can interact with the higher mental functions of meaning and reference—that make is so compelling a practice.

Other attestations of the physicality of the word in Judaic systems come in the context of medieval *Shavuot Torah* rituals. During this festival people

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7. These data are gathered from the Accordance Bible Software Program, 2007 (Oak Tree Software).

often also celebrated the rite of passage for a boy beginning his religious studies. One such attestation comes in a common German tradition noted by Marcus (1996, 2004) and Kanarfogel (1992) from *Sefer ha-Roqeaḥ* (Book of the Perfumer) by R. Eleazar b. Judah of Worms (*c.*1160–1230). R. Eleazar's account describes a ritual in which "specific biblical verses are to be written on a school tablet, on a cake, and on an egg." The tablet is brought over with some letters written on it and two Biblical verses (Deut. 33:4 and Lev. 1:1). The child sits on the teachers lap. Then the teacher "reads the letters first forwards, then backwards, and finally in symmetrically paired combinations" (Marcus 2004: 69). The boy then tries to recite the same way. Next, they bring cake kneaded with honey on which the verse Isaiah 50:4-5 is written. The verse is recited. Then a cooked peeled egg with the verse Ezekiel 3:3 is brought out and the verse is recited; this is a famous verse where Ezekiel eats a scroll and it tastes as sweet as honey. Next "they feed the boy the cake and the egg because it is good for the opening of the heart (*li-petiḥat ha-lev*)" (Marcus 1996: 28). The child then recites an incantation adjuring "the prince of forgetfulness" (*sar ha-shikheḥah*) and given some fruit and other delicacies. Lastly the child is sat by a river bank and told that the Torah, "like the rushing water, will never end" (Marcus 2004: 70).

Though on a slightly different level, we might also include on this list the ritual practices directed towards the *Torah* scroll. The scrolls are kept in a container behind a curtain (called an "ark"), great pains are kept so that the scroll itself is not touched, and the scroll is adorned with a crown. Perhaps most interesting for my purposes is the parading, kissing, and undressing of the Torah scroll before its reading in the synagogue each week.

A final ritual of note concerns what is known as *shaimos* (or names) box, practices that draw their rationale from Deuteronomy 12:3-4:

אֶת וְאִבַּדְתֶּם־מְו שְׁמָם־הַהוּא הַמָּקוֹם׃
אֱלֹ הֵיכֶם לַיהוָה כֵּן תַעֲשׂוּן־לֹ א׃
BHS

"… and you shall destroy their name in that place. But do not do so to Yahweh your god"

Most Jewish communities post these boxes to deposit any artifacts containing the name of God that must be discarded. The *shaimos* box is buried in a ritual process usually once a year around Passover. There are parallels to this treatment of the name documented in the archaizing of divine name at Qumran (Tov 2002: 201), and the burial of some sacred texts at Masada (*ibid.*: 207). The Cairo Genizah, a treasure trove of Judaic texts discovered in Cairo in the nineteenth century, was basically a giant *shaimos* box.

BRAIN PHYSIOLOGY

These types of rituals are the class of phenomenon under which names should be understood in Judaic systems, where written names are physical features of the world to be consumed, digested, paraded, and buried like the dead. This might be said to be the way naming works religiously, but how do names work physiologically? The fields of neurology and ethology have recently made some great strides in answering the question. As Muller and Kutas report:

> The use of names, albeit not necessarily acoustic, is widespread in animals for courtship and rearing of offspring, etc. In a bird colony, for example, a returning parent must identify its chick among thousands of others by auditory and visual features, even if it has changed location. In this example the acoustic signal can be taken as the name of the individual. Because it has an evolutionary advantage, signal use for identifying certain individuals has a longer phylogenetic history than language. Even though humans replaced individual signals with linguistic ones, there might remain a physiological difference in processing signals that stand for certain individuals as opposed to those that stand for categories of objects.   (Muller & Kutas 1996: 225)

So it is pretty clear that non-human animals have a version of this type of information, signals that stand for specific individuals in a local communicative context, and that this ability to name is in some sense instantiated in animal brains. It is also clear that the naming of domesticated animals such as dogs and cats with human names has a profound effect on how we conceive of them. This is part of what sparked the controversy when Jane Goodall first chose to name her Chimpanzee subjects in contradistinction to the prevailing scientific practice (Vitale 2010).

   As noted in the quotation above, in certain bird species names are a very mechanical one to one identity between a specific sound and voice and a particular bird, thus letting a mother bird recognize her young from a mass of other birds. Dolphins are thus far the best attested species to have anything close to robust human naming. Janik (2006) conducted experiments with bottleneck dolphins and found that they "are the only animals other than humans that have been shown to transmit identity information independent of the caller's voice or location" (*ibid*.: 8293). They were able to determine this by gauging the reaction of dolphins to specific sounds whose voice characteristics had been removed—retaining the "frequency modulation" while removing any voice "signature." True human naming, in other words, involves a level of digital abstraction once removed from the naming exemplified by birds.

No non-arbitrary, analog trace between the sound, such as the timbre of the voice, and the object of reference need remain. Names are thus a more "primitive" form of representation than language at large at the same time that they retain the distinctly digital element of language as a whole. This aspect of human naming where any analogical dimension such as the timbre of the voice can be removed is a vital feature of the way human language works in general. But names are more "primitive" at the same time because they are forced into the level of analogical "baptism." That is, names mark individual and unique tokens in a one to one relation.

Names are also differentiated from other terms at the level of brain physiology. Especially interesting for the neuroscience of naming has been studies of global aphasics who are able to remember famous names but not other names. Researchers believe the reason for this occurrence in aphasics is that names do not need to access lexical memory systems to the same degree as other nouns. The idea is that the global neural web of nouns is more fragile than the system responsible for names, because if one part of the network is thrown off, since it is a relational system, the entire semantic apparatus will be affected. The argument is that this is not so with names, which rely on different and older memory systems.

Recent neuroimaging data and brain studies have confirmed other ways that "proper names are neuropsychologically and anatomically processed in a manner that differs from the processing of common nouns" (Yasuda *et al.* 2000: 1067). Though naming like most thought processes is a distributed brain phenomenon, there is pretty general agreement that names are partly processed in the Fusiform gyrus, the part of the temporal lobe that is also responsible for word, face, and number recognition. The gyrus, "forms a processing network for people's names with the temporal pole and postero temporo/occipital lobe" (*ibid.*: 1067). Damasio *et al.* (1996; reported in Tsukiura *et al.* 2002: 922) found that different areas of the temporal lobe are activated for different categories of name: for example famous persons, animals, or names of tools. Other researchers have confirmed this, that "the left anterior temporal region is crucial for the retrieval of people's names irrespective of their familiarity," but in addition that "the right superior temporal and bilateral prefrontal areas are crucial for the process of associating newly learned people's faces and names" (Tsukiura *et al.* 2002: 922). This is so because the right hemisphere appears to play more of a role in face recognition and in particular "has a role only in associative learning of faces with names or retrieving newly learned people's names from face cues" (*ibid.*: 929). So the neural correlates to naming appear to be laterally differentiated, at least in humans.

To sum up, we may say that names appear to be stored or accessed differently than other words in memory. Naming appears to be akin to more "primitive," older forms of "information" management in other animals. Names transcend the distinction between episodic and semantic memory,

to some extent, since they possess features of both. That is, they take part in some semantic encoding at the same time that they can be accessed imagistically (i.e., face recognition). This is consistent with the philosophical debates about whether names possess normal semantic content or are purely denotational, possessing no semantic content (Kripke 1981). Perhaps the best answer/non-answer is that it depends on the context in which a name is used.

MATERIAL SYMBOLS AND DISTRIBUTED COGNITION

Though there are physical correlates to naming as noted, names are not reducible to brain physiology. The neural and other physiological processes are necessary for naming but not sufficient. Names are the earliest and perhaps the primary fulcrum for distributed forms of cognition, for they serve to draw and focus attention in a powerful way because they index objects in the world that symbolic language cannot. In human populations, of course, especially with the appearance of certain communicative technologies like writing, names can take on an unprecedented power of organization and control.

Judaic texts such as the Bible and Talmud are like buildings or virtual temples (Schwarzer 2001). They are built up through a process of what cognitive scientists call "distributed cognition." There are strong and weak forms of distributed cognition. The stronger forms of distributed cognition are defined in part by the phenomenon of emergence, which is when the distributed system can be characterized by some empirically tractable property that was not present, or presented differently, in any of the individuals that make up the system.

An ant colony, for example, can be described as a distributed cognitive system because the colony as a whole is able to perform a certain type of computation that the individual ants cannot, though they are of course not aware they are doing it. This is the behavior known as FCF ("find the path to the closest food source"), which emerges based on rather simple rules. Ants leave trails of pheromones as they walk. If no food source is present they search randomly. If a pheromone is present they follow the trail, and when they find food they walk back to the nest. This process leads to a reinforcing of the trails that lead to the closest food source (Poirer & Chicoisne 2008).

In humans, distributed processes are similarly "distributed across internal and external structures—across people, artifacts, space and time." With regard to the subject at hand, all forms of writing lend themselves to distributed cognition. O'Hara (2002), for example, argues that writing should be understood as a form of hybrid problem solving, that "the artifacts and external resources with which we interact are a fundamental part of the

cognitive system itself" (*ibid.*: 272). By the first millennium BCE writing had sufficiently established itself as a form of distributed cognition. Just as digital technology is today, writing was (and still is) an emergent technology that changed the way in which some groups thought through certain problems (Day 2004).

Though shrouded in mystery, the corpus of Judaic texts must have formed through a process of distributed cognition. A good example of the process comes in Philip Davies's (2000) conjecture about how the prophetic books of the Hebrew Bible, which even today is organized under the names of biblical prophets, came together. Davies provides a historical conjecture about the literary production of the Judaic texts. The conjecture is useful primarily to think about the process and materials of production. Davies envisions a radically close relation between "prophetism and scribalism" due to the nature of the archival process.

Briefly, he argues that this production (or reflection) was a five-stage process. Based on evidence from Mari, Uruk, and Assyria, Davies argues that the initial stage of the process begins either with the report of an oral pronouncement or with a literary pronouncement, such as the letter portrayed in 2 Chronicles 21:12, that finds its way into a temple or royal archive. Regardless of the mode by which a letter or report came to its recipient, in the second stage it was likely filed, shelved, or boxed in an archive according to the name of the sender. As letters were gathered associated with different names, the file would grow.

At some stage, letters, reports, and larger scrolls may have been grouped according to other themes. A corpus begins to build, and should a file require copying, it is likely that they would be copied onto a single piece of leather. Davies thus argues that an "archiving mentality" was important to the production process, especially to the extent that it attached particular files to particular names. Davies cautions that this exact procedure is "not intended to account for the origins of all the 'prophetic' books" though it does explain some of their incoherence. Rather, Davies suggests this "only as an evolutionary stage." In this model, "material is grouped into single scrolls for convenience and is intended to be consulted or retrieved or scanned by the curious—if intended to be read at all" (Davies 2000: 75).

After the archival stage comes the compositional stage. This stage concerns subsequent copying and the addition of elements of "detail, expansion, or structural organization" (*ibid.*). According to Davies, the compositional stage is in turn made up of three stages. In the first, we find copying, iteration, and expansion.

However, this stage is not enough to explain the prophetic scrolls. Between this stage and the final stage when prophetic texts are "studied along with law and proverbs by the educated person in the 2nd century BCE," (*ibid.*) we have a stage in which "the idea of 'prophecy'" is produced "as an institution of divine guidance of national history" (*ibid.*: 77). That is,

we find "various processes of 'historicization' within these 'prophetic' collections." Historical contextualization does not come at the beginning of the process, but towards the end.

Davies adds further caution: that it is a mistake to "assume that the process of production is driven by a consistent theological, ideological, or literary purpose" (*ibid.*: 78). This should perhaps be obvious since the production process, on most accounts, spans five to ten centuries, and thus hundreds or thousands of individuals' particular purposes. Despite this warning, Davies goes on to suggest some possible motivations for the composition of prophecy; namely, prophecy as social critique, in which a particular scribe could couch his criticism in the words of older prophets. Davies argues that many of the prophetic books are exploring the question of the world order in light of a colonial experience:

> In much of the 'prophetic' literature one can detect the kind of interest in the political implications of a colonial monotheism that fits perhaps better with the scribes employed by the administrative center, be that the colonial governor's or the high priest's, than with intermediaries. Among the motives for the generation of the material in the prophetic scrolls—and perhaps for the editing of these scrolls—may lie an intellectual agenda, allied to historiography.   (Davies 2000: 78)

The fourth stage concerns "the development of a historiographical corpus," which then served as the historical backdrop for the prophetic compositions. The fifth stage is the last in the production process when prophetic scrolls were held in enough intellectual and religious esteem to be canonized by the outset of the Common Era.

I labor these points about the formation of the Hebrew Bible because they actually foreshadow the production of later Judaic texts for which there is more evidence. The Talmud might be understood as a building where newer structures are put in place on top of and in relation to previous ones. As Neusner (2004) has argued, the various levels of the Talmud emerged in response to crisis that elite scholars and scribes were facing from the second century BCE until the sixth century CE.

The Mishna is thought to have started as an oral code that was set down in the second century CE after hundreds of years of debate in Judaic systems in Palestine. The Talmud in turn represented commentaries and rulings about those initial rules. The formatting of Talmudic texts since the Middle Ages spatially represents this historically layered structure (Figure 7.2). This type of formatting of Talmudic texts has been relatively constant at least since the editions printed by Joshua and Gershom Soncino, an Italian Sephardi Jewish family of printers, at the turn of the fifteenth century.
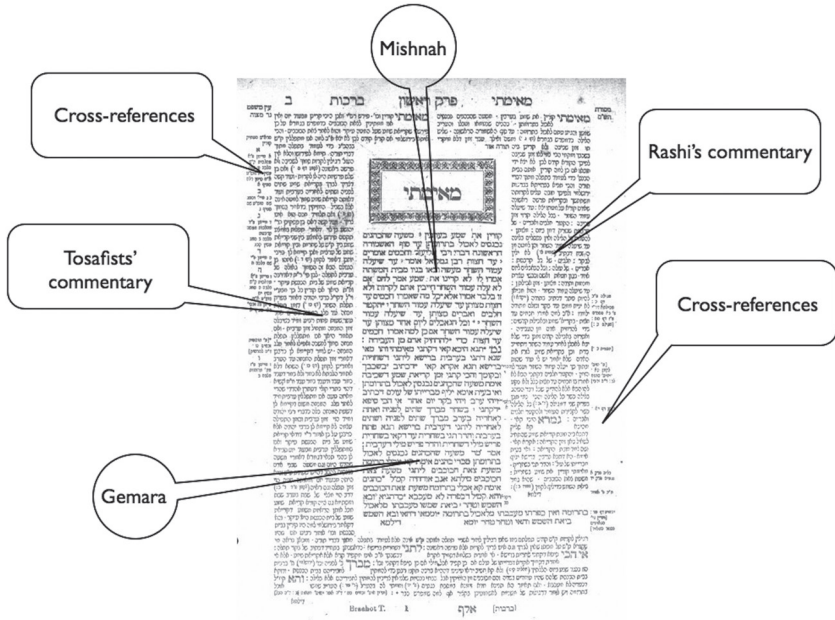
Figure 7.2 Layout of a typical page of the Babylonian Talmud.

Davies (2000) gives us a nice story about the way in which texts move through time and space. I would characterize their production as a form of distributed cognition. Names fit into this paradigm by organizing information in distributed networks. But how in particular does this work?

Though he is mostly concerned with spoken language, a possible answer may come in seeing names as what Andy Clark (2006) calls "material symbols." He argues that instead of an inert translation device between an inner and outer form "the role of public language" is "more like that of the spade" (*ibid*.: 292).[8]

I propose that the use of names in the Bible, and the evolving tradition concerning the name of God in later Judaic sources is a particularly poignant example of the kind of irreducible interaction with material symbols that Clark and others have discussed at length. The pertinent question is how does the use of this form of distributed cognition with regard to names in the Judaic case compare with other modes of life and forms of religion?

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8. For Clark, language "occupies a wonderfully ambiguous position on any hybrid cognitive stage, since it seems to straddle the internal-external borderline itself, looking one moment like any other piece of the biological equipment, and at the next like a peculiarly potent piece of external cognitive scaffolding" (A. Clark 2006: 293). For more on the relation to Clark's argument, see Levy (2012: 111–15).

For one thing, interaction with written texts especially appears to alter the way we conceptualize language. Though both oral and written language are material symbols in the way Clark describes, the physics involved in hearing and seeing is very different and contributes to quite different cognitive affordances. It is not that one is right and one is wrong, or one is primitive and another is progressive. Rather written technologies change the way we are embodied as subjects in the world, what opportunities are presented to us, but it also appears to limit thought in profound ways.

Perhaps we should view ancient Biblical texts as some of the earliest technologies that ramp up the digitization of human thought, a phenomenon that has only accelerated in recent years (Levy 2010). Returning to the discussion about the relation between analog and digital signals (signals based on tokens and signals based on types) Clark gives examples of three "orders" of the use of such technology to offload resources from our working memory, and the profound effect this has on thought.

Clark takes as example of the first order cognitive involvement of materialized language the case of Sheba the chimpanzee, who has undergone numerical training and thus knows about numerals (that is, digits). In an experiment Sheba and an untrained chimpanzee named Sarah are shown two piles of treats with unequal number. What Sheba points to, Sarah gets. Sheba points to the larger pile, and Sarah gets more treats, to the annoyance of Sheba. However, "when the treats arrive in containers with a cover bearing numerals on top, the spell is broken and Sheba points to the lesser number, thus gaining more treats" (A. Clark 2006: 293). Clark argues that:

> the material symbols, by being simple and stripped of most treat-signifying physical cues, allow the chimps to sidestep the capture of their own behavior by ecologically-specific fast-and-frugal subroutines. The symbol loosens the bond between agent and world, and between perception and action, and it does so not in virtue of being the key to a rich mental representation (though it may be that too) but rather by itself, qua material symbol, providing a new target for selective attention and a new fulcrum for the control of action.   (*Ibid*.: 293–4)

Human beings appear to possess a critical mass of neurons dedicated to working memory that allows our spoken language to function like Sheba's numerals. But there is a limit to the metarepresentational capacities of human working memory. The offloading is possible with oral speech especially when mediated through complex ritual traditions such of memorization and performance whether the Vedas or ancient bards, but is much more powerful when written language comes into the picture.

Clark categorizes this process as one of labeling; we could also characterize it as a 'mark-up' language. He encourages us to think of this as the

first step of digitization, the placing of a higher-order label such as 0 or 1. Clark recalls a similar experiment as illustration. In this experiment language-naive chimpanzees are trained to associate simple plastic shapes with relations of sameness and difference. A pair such as cup-cup would be associated with a red triangle and cup-shoe with a blue circle. Amazingly, by this simple act of labeling, the chimpanzees are then able to judge higher order relations that they would not be able to manage under normal circumstances. Thus, they interact with the concept of "higher-order sameness" and difference, in their judgment for example that the pair cup-cup and cup-shoe are different. For the chimpanzees this is primarily made possible by easing of constraints on working memory; "by mentally recalling the tags" they can "reduce the higher-order problem to a lower-order one." In this case the move from type to token solves the problem because the token is more easily manipulated than the higher order concepts. The reason this is important will become apparent, but it is precisely this layering of relations that make digital media like literacy so powerful.

Skipping ahead in Clark's argument, he goes even further to what he calls the third grade of cognitive involvement: "language as providing some of the proper parts for hybrid thoughts." In this part of the story, the primary example is mathematical language. He asks, "what is going on when you think the thought that '98 is one more than 97'?" The answer comes from the work of Stanislas Dehaene and colleagues (1999), who argue that "precise mathematical thought" emerges at the "productive intersection of three distinct cognitive contributions." The first is a basic biological capacity that some non-human animals also possess to individuate small quantities; that is, 1-ness, 2-ness, 3-ness and many-ness. The second is another basic biological capacity for "approximate reasoning concerning magnitudes": a basic sense of greater and less than. The third, "not biologically basic, but arguably transformative," is the learned use of number words, that is language, which for Clark is the externalized use of irreducible material symbols. This third feature leads to "the eventual appreciation that each such number word names a distinct quantity" (A. Clark 2006: 297). But Clark advises us to notice that:

> this is not the same as appreciating, in at least one important sense, just what that quantity is. Most of us can't form any clear image of, e.g., of 98-ness (unlike, say, 2-ness). But we appreciate nonetheless that the number word '98' names a unique quantity in between 97 and 99. (*Ibid*.: 297)

I want to point to the deep connection between the origins of numerical thinking and literacy in the ancient Near East. In both cases, we can 'know' about something (numbers, words) of which we do not necessarily have an intuitive grasp. Written letters served as the first symbols of

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Table 7.2 Depiction of analog, hybrid, and digital numerals.

Analog	Digital	Hybrid
𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷 𝍷𝍷𝍷𝍷	כה	25

numbers. These symbols were able to deal with greater levels of mathematical abstraction. Fully digital numbers were only possible after the rediscovery of 0.

A fourth element that Clark adds concerning these quantities is "the rough appreciation of where that quantity lies on a kind of approximate, analog number line (e.g. 98 is just less than halfway between 1 and 200)" (A. Clark 2006: 298).[9] That is, we start with a sense of the number line and later go on to digitize the line when we learn about precise numeric quantities. When we combine all four of these we find a dynamic interaction between analog and digital systems that forms the basis of both literacy and mathematics.[10]

Why is it that modern computers use binary digits instead of an analog system? The main reason is that it is far simpler to build a computing system on a physical differentiation like off/on. All stored forms digital media must eventually cash out in a physical differentiation of a similar type for the reasons Clark describes. For example, most computer memory is made up of microscopic magnetic fields on its hard disc that represent the zeros and ones of the binary code. Modern computing started, of course, with vacuum tubes that performed the same function though with difference constraints (or affordances) on the technology. In the same way as Clark's examples, it is the fact that these are material objects manipulated in space that gives them their power.

Mathematics would not be possible without the use of material, written numerals. Of course, some mathematicians can do everything in their head, but the nuts and bolts work has to be done outside the head, with material manipulation. Nowadays most of this type of manipulation is done with

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9. In an effect called SNARC (spatial numerical association of response codes), the direction in which written language goes (right to left for Hebrew, for instance) also determines the direction of the number line in terms of the relation between 0 and infinity (so, for Hebrew writers, infinity is to the left).

10. It is precisely the arbitrariness and orthogonality of material symbols like language and mathematics that gives it computational power. For the argument in full, see A. Clark (2006: 295).

calculators and other types of computers. This hybridity between cognitive technologies and brains is not something new, but probably something that characterizes the genus *Homo* to the core, beginning with *Homo habilis*, "handy-man," from about 2 million years ago (Wrangham 2009). The hybridity between analog and digital, the ability to move back and forth between levels, in technologies like language, writing, or computers that give them such immense power. Digital signals interact primarily through numeric manipulation—and this marks the source of their power in terms of copying and transmission.

I see a very close analogy here between Sheba's labels and names. Names in general, but especially in the case of Judaic texts, condense much more complex information into a device of simple reference. The names themselves can then be manipulated, which affects the much more complicated elements for which they stand. By manipulating the names instead of the information they condense, the computational demands of the problem are eased. Judaic systems build circuits with these names in order to solve broader intellectual and existential problems, and eventually, as these networks develop, the names become indispensable to solving those problems. So the juxtaposition of the names El Shaddai and Yahweh solved the problem about changing conceptions of divinity in light of changing material circumstances.

The analogical or indexical relation between material symbols qua material token and a particular object in the world (reference) does indeed represent a primitive mimesis at the heart of language that is digitized when grammar and meta-representation kick-in in high gear. Following Smith and Gasser (2005), Clark addresses this by asking "Why, given that human beings are such experts at grounded, concrete, sensorimotor driven forms of learning, do the symbol systems of public language take the special and rather rarified forms that they do?" (A. Clark 2006: 295) In other words, Clark asks, why does language seem to lead us to such digital abstraction if intuitive forms of learning are based on analogical concrete forms of embodiment? One possible answer, he says, "is that language is like that because (biologically basic) thought is like that, and the forms and structures of language reflect this fact." In other words, digital language is like that because biological operations are also complicated digital operations. But Clark does not like this answer, rather he "says just the opposite": language is like that because biologically basic thought is *not* like that (*ibid*.: 295). In other words, the difference between analogical and digital formats is what gives language such power.

Names serve as indexes for other objects. They thus lie on a middle grade between symbolic meaning and iconic forms; their arbitrariness allows them to conform to a digital network, but they are non-arbitrary to the extent that to have content there must be that referential baptism in human experience. Names access those fast and frugal brain subroutines at

a level that symbolic language as a whole does not. I have argued that, in its combination of distributed cognition and more biologically basic encoding, naming takes on "numinous" qualities that religion can plug into.

CONCLUSION

Take a look at the Google Trends webpage at "google.com/trends" and you will see that on any particular day, most, or many, of the so-called "hot searches" are proper names (today, 8 out of 10 were proper names). Why is this so? The answer may be obvious, but the implications are important. The reason is because proper names represent a more efficient way to search for most information because they are specific in a different kind of way from regular nouns. Proper names, we could say, carry with them a different type of information based on something like a primordial baptism in time and space.

Human beings (along with all other animals) are "epistemically hungry," "informavores," that are constantly on the lookout for "information."[11] I place information in quotations because information always represents some relation between recipient and environment. In other words there is no essential feature of information except that it is taken as such by some agent. Information leads to some change in state, mental or behavioral, in the agent. This informational search sometimes goes haywire, as in the case of compulsive hoarding, where individuals stock up such things as newspapers and other trinkets because they do not want to lose any information that might be relevant in the future (see Frost & Steketee 2010: 38, 66).

The dopaminergic system is primal to human and animal motivation in general, providing a basic "reward" for movement that would typically be toward food and sex (perhaps the metaphor of "hunger" is not so metaphorical after all) or information that could potentially lead to food or sex (see, for example, Oei *et al.* 2012). So many scientists now think that the neurotransmitter dopamine plays a central role in such pathologies that over-actively search for and store information. For example, when a person is given too much dopamine in the process of treating Parkinson's disease, they have a tendency to look for relevant patterns hyperactively (and are often compulsive gamblers as a result; see Lehrer 2007).

My point is that the Internet is a vast source of information that many people search, with Google especially, on a daily basis.[12] The "search space,"

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11. See Dennett (1996: 82). "Informavore" is George Miller's phrase, according to Dennett.
12. For more on the comparison of Talmud and Internet, see Rosen (2000). Mel Alexenberg (2006: 23–4)also has an insightful discussion of the issue and may have been the first to make the comparison. Alexenberg argues that postmodern art and

as cognitive scientists would call it, is virtually limitless, presenting a problem the Google search algorithm was built to solve (Heintz 2008). A similar problem was presented to Judaic systems with the construction of scripture. Suddenly a great deal of information was available in written form. The term *Midrash* is derived from the word for searching for information from a diviner and eventually came to mean something like re*search* (see Preus 1991, 1998). But these early scholars had nothing like a Google search algorithm to help them. In lieu of the algorithm they developed their own mnemonic methods. The point I am winding to in conclusion is that names, specifically names of God, play a central role in such search spaces.

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mentality is part of a movement from Greek to Hebrew consciousness where "the message of Torah must not be enslaved in the rectangle" (*ibid.*: 11).