

**“Where was I?”:
Personal Experience Narrative,
Crystallization and Some
Thoughts on Tradition
Memory**

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Several years ago, I was rather surprised when one of my daughter's friend's parents asked me if I could help her with brain surgery in a few weeks' time. She assured me that she was, in fact, a medical doctor and a practicing surgeon and that the request was sincere. We would not be performing amateur neurosurgery on an unsuspecting passer-by as part of a bizarre Southern Californian cult ritual. Rather, she would be trying to help a young woman regain her health by excising a remarkably aggressive tumor lodged deep in her brain. I indicated that two weeks might not be enough time for me to learn how to perform surgery, particularly something as delicate as neurosurgery, as opposed to something coarser, say an appendectomy or a simple amputation. I also reminded her that my doctor title was strictly related to philosophy: "Unless your patient is suffering from the effects of repeated attempts at deconstructing literary texts," I said, "or an inexplicable desire to perform Finnish epic songs while strumming a *kantele*, I doubt that I can be of much

use." But my "colleague" persisted, and explained that she needed me more for my Danish language skills than any alleged ability to decode literary texts or analyze traditional expressions. Having only encountered one other situation where I was sought out for my ability to speak Danish (that involving Kelsey Grammar, a Snickers bar, and a large multinational telecommunications firm), I acquiesced. This opportunity also allowed me to enter something on my shared university calendar that, if encountered by nosy legislators, might finally justify my employment.

The surgery was relatively straightforward from my perspective. The cranium had already been removed by the time I arrived in the operating theater, and no one asked me to close at the end. My task was simple: I was to speak Danish with the very conscious patient, making sure that she recognized pictures on flash cards, could maintain as coherent a conversation as possible while someone rooted about in her brain, and that she did not begin to speak nonsense or make strange noises. The patient was a young woman whose first language was Danish but who had learned English at such an early age that she was considered to be a "true" bilingual. The goal, as my colleague put it, was to avoid "cutting out" her Danish; they had "mapped" her language centers but, because she was bilingual, the fear was that her Danish language did not map to the same area as her English. The neurologist explained that language for this patient could have more than the one center that is common in most monolingual patients. By applying

electric currents to various parts of the brain while the patient spoke, my colleague could check the preexisting map and avoid paths toward the lesion that would disrupt possibly fragile language networks. The surgery was a success, the lesion was removed, and, the next day, I had a wrap up conversation with the sedated but grateful patient. Her Danish was fine. My colleague had said she was worried about the odd sounds coming from the woman during surgery, but I assured her that it was standard Danish.

While the patient's linguistic capacities remained intact, the experience brought home to me the very physicality of language and, by extension, memory. Often, in the humanities, we conceive of human expression—language and the expressions that are built around language—in ways that are quite divorced from this physicality. But my experiences during this surgery made it quite clear—as clear as it could possibly be—that language and memory (and, by extension, learning) are, among other things, connected to physiologic structures and the result of neurobiological processes. The pre-surgical preparations and the surgery itself also made absolutely explicit that no two brains are alike (Schumann 2004). Not only does each individual have a brain that has been shaped by their genetic inheritance, but that brain has been further shaped by (and is constantly being shaped by) environmental factors—either inputs through the senses or very real physical changes caused by disease, injury or, in this case, deliberate intervention (Schumann, Crowell, et al. 2004). Several weeks later, at a so-

cial gathering, I met my colleague and her husband—also a neurosurgeon—and I began to ask questions about the implications of the physiological structure of the brain and the neurobiological processes linked to language, learning, and memory that might help us understand traditional expression in ways other than those prevalent in the academy. Since I was so flabbergasted by the idea that language exists discretely in a section of the brain so readily identifiable, I wondered if tradition too might be linked to special mechanisms—or even specific sites—in the brain that differentiate tradition from other forms of memory.

In short, the surgery sparked my interest in the neurophysiologic processes of tradition and touched off a series of questions that I will attempt to address, however inadequately, in this short essay. Is there such a thing as “tradition memory”? Do traditions present in neurological terms differently than other types of memory? Does the process of expressing traditions verbally present in a neurologically different manner than what cognitive psychologists label “normal speech”? Is there a neurobiological process behind Hymes's (1975) breakthrough into performance? Can an appreciation of neurobiological processes also help explain the long apprenticeship and subsequent mastery of epic tradition among the singers encountered by Milman Parry and Albert Lord (Lord 1964)? Does one learn and process tradition as language and, if so, is it more akin to native language acquisition or second language acquisition? Or does one learn and process tradition as lived experi-

ence? How does one transform lived experience into traditional expression? To what degree is tradition production—acquisition, storage, and, most importantly, retrieval—automated compared to natural native language or other habitual skills? Or is it not an automatic process at all? Is it an automatic process for some people and not an automatic process for others? In other words, to what degree is tradition conditioned by declarative memory and to what extent is it subsumed by procedural memory? Similarly, why are some people so attracted to aspects of a tradition (active participants) that they master it and others do not (von Sydow 1948)? What accounts for the varying levels of skill and attraction that one finds in any community in regards to all of the community’s traditions? Speaking more basically, to what extent is tradition conditioned by neurobiology and genetic inheritance, and to what extent is it conditioned by environment? This essay is intended to begin asking these questions about tradition in a most preliminary fashion while appealing to theories of memory, learning, and forgetting. The tentative suggestions put forward here—and I stress tentative—might help us widen our ability to understand how the dialectic tension between individual and tradition that is the fundamental basis for folklore functions not only in society but, quite physically, in individuals who make up those societies (Chesnutt 1999).

Before I speculate briefly on these questions in the context of a small set of folkloric data (a chain transmission of the legend “The Hook” and a net-

work transmission of “The Fifty Dollar Porsche” both by a group of UCLA undergraduates), it seems prudent to provide an overview of current models of memory in the brain and to describe, however briefly, some of the main approaches to memory and tradition. I will conclude with a short overview of Multiple Trace Theory (MTT), a theory that has some significant advantages over the Standard Theory of memory consolidation in the context of understanding variation and stability in tradition, and can perhaps provide some more insight into those small experimental data sets. The two small data sets have significant constraints as suitable test data, and it may well be possible to design more rigorous experiments to test these hypotheses in the future.

Questions of variation and stability in tradition have been quite vexing ones for folklorists, at the same time as those two features have also helped define the bounds of the field itself. Early folklorists often neglected to pay attention to the actual individual tradition participants, positing a superorganic view of tradition that was very far from a view of tradition that could incorporate considerations of individual brain structure and function (Krohn 1926). Even Walter Anderson’s (1923) classic theory of “self correction”—a notion that a story would be brought back into line with its traditional form by other tradition participants because of repeated telling of the story and repeated hearings of the story through time—suggests that stories have a life of their own. In its best articulation the “law of self correction” is related to questions of memory and

reinforcement—a person who has heard and remembered a story multiple times and from multiple sources is likely to reject external idiosyncrasies in favor of his or her own memories. More recent studies of individual repertoires and world view, such as those of Pentikäinen (1978), Siikala (1990), Kaivola-Bregenhøj (1996), Dégh (1989; 1995), and Palkó and Dégh (1995), as well as my own study of nineteenth-century Danish storytellers (Tangherlini 1994a), place far more emphasis on the individual and the complex societies in which he or she lives and participates in traditional practices. Yet, in all of these studies, there is no real discussion of why individuals might have different repertoires. Generally, these studies simply offer the observation that these differences exist and reflect an aspect of an individual's world view (Pentikäinen 1978).

A decade or so ago, David Rubin (1995), in his *Memory in Oral Tradition*, attempted to bring the perspectives of a cognitive psychologist to bear on a narrow range of oral traditional genres. In his study, he concentrated on rhymed or sung (or rhymed and sung) traditions, and attempted to align findings from folklore theory—particularly Parry and Lord's Oral-Formulaic Theory—with the then current theories about remembering and forgetting. He proposed early on in his study that learning traditional expression—particularly genres such as counting out rhymes, ballad singing, and epic singing—is equivalent to learning one's native language, stating, "genres of oral traditions can be considered as poetic languages, or overlay systems, or rule bound registers of speech.

Second, learning such poetic languages is similar in many ways to learning first languages" and offered five points to support this hypothesis, including the important—yet potentially false—observation that "the process of learning and what is learned are not available to introspection" (136). In this context, "introspection" means that an individual is not only aware that he or she is learning but is also aware of what, and how, he or she is learning. Rubin opined that, while "Memory is often considered as a storehouse...for oral traditions a better metaphor is that of a well-practiced skill dependent on extensive experience" (Rubin 1995, 146). This latter observation proposes that tradition is largely related to automatic processes of nondeclarative, procedural memory, a position that is somewhat extreme (Rubin 1995, 136). Not all traditional performance is automatic, and a great deal of oral tradition is available to introspection, particularly for the most competent and active participants in that tradition.

The underlying theoretical orientation of Rubin's (1995) approach to aspects of stability and variation is described as "cue-item discriminability." This position holds that recall [of oral traditions] starts with the first word of the song and proceeds in a linear fashion. Words sung are cues for words yet to be sung. If words are to be recalled, they must be discriminated from other words in memory. The general constraints of the genre and piece, especially rhythm, act as cues from the start, with the singing filling in other cues as it progresses...This process, after the initial, often conscious decision to sing a

song has been made, can go on without conscious intervention, using what has been called implicit (*nondeclarative*) or indirect memory. The serial-recall method, however, means that knowledge in oral traditions is not routinely accessed without the cues provided by a running start and often cannot be accessed without them. (192)

Thus, the performance of a traditional expression, once begun, proceeds automatically, with little recourse to introspection. Rubin, of course, has overstated the case for sung tradition in his emphasis on the “running start.” Although many tradition participants often need a “running start” to access certain expressions, others—those that Bengt Holbek (1987) characterizes as the “craftsmen” of tradition—do not.

The example that Rubin offers of the folk singer who needs to wait for the chorus to come around again before he can sing it is so recognizably incorrect for “craftsmen” of a tradition that the folk singer Arlo Guthrie (1967) includes a humorous gloss on it in his well-known live rendition of “Alice’s Restaurant.” In that song he addresses his audience, saying, “So we’ll wait for it to come around on the guitar here and sing it when it does. Here it comes...” In response, the audience laughs, acknowledging the unlikely premise that Guthrie needs this type of cue to sing the refrain even though they might well need that type of cue. While it is probably true that, for most tradition participants, this type of cue-item discriminability is necessary for successful recall of a traditional expression, for the most active and competent tradition participants,

access to any part of the expression is far less dependent on cueing. Studies of singers of epic, such as those by Lord, confirm the ability of expert singers to begin and end singing in multiple points in the epic, and to modify their singing quite dramatically to respond to the exigencies of the immediate performance context (Lord, Mitchell, et al. 2000). Of course, on the opposite extreme, the least active tradition participants may not be able to produce a recognizable variant of a traditional expression irrespective of the number of cues they are given.

Rubin’s theory also does little to explain features of non-sung, non-rhythmic tradition, since many of the cues to which he refers are dependent on formal features of rhyme or meter. Rubin presents memory essentially as a mysterious, black-box phenomenon and does not explore the actual processes by which memories are consolidated, stored, and activated. A more contemporary model of memory might help explain the “running start” that he situates as a fundamental component of traditional recall and, at the same time, explain in a more nuanced manner how it is that the “craftsmen” of tradition—the most expert of active tradition participants—might be able to eliminate the need for the “running start.” Such a model might also explain how processes that for some are “automatic,” and not available for introspection or other types of modification, are much more easily accessible to other, more active, tradition participants, both for introspection, innovation, improvisation, and reformulation.

For most tradition participants, tra-

ditional expressions—their memory, their recall and to a certain extent, their performance—are not purely automatic processes as Rubin implies. Years of ethnographic and folkloric research has revealed that individuals’ participation in tradition is best defined on a scale in relation to the least active to the most active participants in a tradition (fig. 1). It is likely that the automatic processes Rubin describes are a fitting characterization of the manner in which tradition participants who cluster toward the middle of that spectrum remember and perform tradition. For other tradition participants, cue-item discriminability is no longer as necessary—for example in the case of tradition participants who have mastered the particular expressive form—or not functional—for example in the case of individuals who have yet to learn or participate in the tradition enough to be able to remember and reproduce expressions (fig. 1).

example above—the song (in this case) is not only readily available for introspection but also for deliberate modification (which is different from accidental modification that one would find at the other end of the spectrum). That is not to say that cue-item discriminability does not play some role in their recall; rather, these “craftsmen” have many more pathways to begin or restart an expression and many more pathways to connect or move between traditional expressions. In contrast, those just learning a tradition have not consolidated the formal features or content to make the type of automatic recall described by Rubin possible. Given the range of variation one encounters in traditional expressive performances, from the performances of the highly competent to the borderline incompetent, there must also be varying degrees of physical connections in the minds of these people for any given expression to explicit or de-

Fig. 1 Declarative memory.



In this illustration, the cue-item discriminability Rubin describes is only functional for those tradition participants who are active in the tradition, yet not masters of it. For masters of a tradition—such as Arlo Guthrie in the

If we are to advance our understanding of how tradition functions on the individual level, we must move beyond the “black box” approach to learning and memory that is implicit in most studies of tradition, and incorporate in

our studies—at least on some level—a consideration of both the physiology and the neurobiology of memory and learning. Schumann points out that “Psychological theory almost universally assumes that across individuals brain structure is homogeneous. Thus, most psychological research on learning proceeds on the notion that all brains are the same...from the perspective of neurobiology, brains are as different as faces” (Schumann, Crowell, et al. 2004, 2). This awareness, that different people learn and remember not only different things but also do so differently may not tell us too much about why traditions persist, but it may help us to understand how traditions persist.

The question of why traditions persist might be subsumed under the neurobiology of motivation and aversion—rewards and value structures can be conditioned by the group and result in measurable changes in neurobiology. These changes result in people seeking out or rejecting environments that, in turn, lead both to learning and to underlying changes in the individual’s brain structure. In a continuous feedback loop, these changes again strengthen the motivation and aversion circuits. What Schumann points out for the context of learning can be extended to learning traditions:

The first interaction involves passive effects, in which the parents, whose genes the child inherits, provide the major environmental input to the child. In the second kind of interaction, the individual chooses and/or creates environments that are compatible with his or her talents. The third way genotype in-

teracts with the environment is through the evocation of responses from the environment. Evocative effects are those that an individual elicits from others. (Schumann, Crowell, et al. 2004, 16)

As a result, “interindividual variations are not seen as exceptions or noise, as in traditional psychology, but rather they are considered as a universal basis on which theories of human cognition must be built” (Schumann, Crowell, et al. 2004, 18). These considerations move us significantly away from an approach that considers folklore simply as behavior (Georges and Jones 1995). Instead, it allows us to explore folklore as part of a complex interaction between the individual and his or her physical and cultural environment as well as the individuated processes and effects related to learning and memory.

Memory is generally broken into two main categories: short-term or working memory, and long-term memory. Schumann notes, “Working memory has traditionally been defined as memory that is held for short periods of time (less than 20 seconds) in order to achieve success at a task...Long term memories are those lasting for extended periods of time, from days, to weeks or for as long as months or years” (Schumann, Crowell, et al. 2004, 4-5). As implied earlier, long-term memory is, in turn, broken into two main categories: declarative or explicit memory and nondeclarative or implicit memory. Again, from Schumann’s summary of a memory taxonomy, one learns that “declarative memories are memories for facts and events, and nondeclarative memories are memories for habits, motor and

perceptual skills, and emotional learning” (Schumann, Crowell, et al. 2004, 5). Each of these two main sets of long-term memory is further broken down into subsets. The subsets of declarative memory are semantic memory and episodic memory. The subsets of nondeclarative memory are conditioning, priming, and procedural memory. It is the last subcategories of each main category of long-term memory—episodic memory and procedural memory—that are of greatest interest to students of tradition. The interaction between these two types of memory—and indeed a particular type of interaction between these two—may well be the locus of what could be called “tradition memory.”

Declarative memory—including the important subset of episodic memory that is implicated in storytelling and traditional expression in general—is centered in the hippocampus. What is interesting is that, once stored, declarative memories are not static. Rather, “memories that have been previously stored have already modified the brain in such a way as to affect the relative ease with which new memories can be formed. In other words, learning not only results in memory but is itself the result of memory... at the cellular level, encoding, storage and retrieval are represented as modifications in the strength of synaptic connections that are constantly being altered as the result of new interactions with our environment” (Schumann, Crowell, et al. 2004, 76). Adding to this “dynamic nature” of long-term, declarative memory that once was considered to be remarkably stable, is the recent discovery that “episodic memories may

maintain traces in the hippocampus for an indefinite period,” a significant departure from “the traditional model, articulated by Squire (Squire, Knowlton, & Musen 1993), [that] suggests that consolidated memories are eventually stored in cortical circuits that are independent of the hippocampus” (Schumann, Crowell, et al. 2004, 95). This dynamic view of declarative memory is an important shift in understanding the physiology of memory and recall and has significant implications for an understanding of stability and variation. Similarly, the interaction between procedural memory and declarative memory as part of the neurobiology of memory consolidation should inform this understanding.

There are two main theories about the consolidation of long-term memories and the manner in which those memories are recalled. Both of these models rely on the relationship between declarative memory and nondeclarative memory. The first, known simply as the Standard Theory of memory consolidation, was first proposed by Müller and Pilzecker (1900). This theory suggests that memory consolidation is time dependent—the memories are first formed in the hippocampus and transferred over time to the neocortex. The traces between the hippocampus and the precortical regions eventually weaken and disappear, while the connections within the neocortex strengthen through repeated recall, consequently, the memory becomes both stable and less susceptible to disruption or damage in its stable state in the precortical regions. The retrieval of these memories relies on a single—

or a small number of—indexical links. This type of indexing explains the “running start,” or cue-item discriminability, emphasized by Rubin, as well as his emphasis on the seeming stability—and automaticization—of traditional expression.

This Standard Theory has been supplanted in recent years by Multiple Trace Theory (MTT). Based on evidence that older consolidated memories can, in fact, be subject to disruption of a kind nearly precluded by the Standard Theory, MTT proposes that the connection between the hippocampus and the neocortex do not dissipate, but rather are continuously reinforced, and new connections from the hippocampus to the neocortex indexing the same memory—and other related memories—are constantly being formed. This dynamic model for long-term memory consolidation aligns better with observations in both stability and variation in tradition (Tangherlini 2003) and also provides a mechanism that contests the notion of serial recall—a hypothesis that is easily falsified by both fieldwork and archival data.

One of the key findings of Nadel and Moscovitch who first proposed MTT in 1997 is summarized by Nancy Jones as follows:

As memories are retrieved and rehearsed, multiple traces are made in the hippocampus... These traces are indexed to locations in the neocortex. Each time a new set of hippocampal traces is made they are also indexed to the cortex. Thus, each time a memory is rehearsed, previously linked cortical regions would be linked to another set of traces. Addition-

ally, as more associations are made, new cortical regions could be added to the total set of traces for the given memory. (Schumann, Crowell, et al. 2004, 117)

Linking of this type allows for the possibility of stories growing and shrinking depending both on performance context and the narrator’s own development as a person. At the same time as it helps explain elasticity, it also helps explain aspects of stability over time—the “underlying” memory persists, it just has multiple indices in the hippocampus that form, are reinforced, or disappear over time.

A key feature of MTT that differentiates it from Standard Theory is the introduction of the possibility of disruption of older, consolidated memories. In MTT it is, “not only temporal duration but also the state of the memory (i.e., whether it has been activated or not) that can affect the stability of the memory” (Schumann, Crowell, et al. 2004, 120). This observation helps explain, for example, the wide range of variation one finds between variants of a story told by an active participant—whose memories might be frequently activated, and thus show both a high degree of stability, and a significant amount of indexicality between the hippocampus and the neocortex, thereby allowing for multiple “ins” to the storytelling—and a passive tradition participant whose memory of that same story may have been disrupted either by other environmental inputs, or by the lack of frequent activation, or both. At best, this passive tradition participant would need the “running start” to activate the initial index to the disrupted and weakly linked

memory in the neocortex. Indeed, he or she may need multiple running starts or additional prompting to access these memories—a phenomenon attested to by many fieldworkers.

The fragility of long-term memories—including long-term, episodic memories—is addressed well by MTT. In various studies such as those by Loftus, Miller, and Burns (1978) episodic memories for events were shown to be alterable by post-event information—a situation that mimics well the impact that tradition can have on individuals in the creation of personal experience narratives. I would argue that the paramedics with whom I worked often had their episodic memories for events “interrupted” by post-event information, often provided during the initial telling of the newly forming personal experience narrative (Tangherlini 1998). These “interruptions” were, of course, part of the tradition itself, and helped the medic consolidate the experiences of the events into a narrative episodic memory that conformed to the expectations of the group yet maintained the unique aspects of the discrete event (Tangherlini 1998; 2000).

The connection between episodic memory and procedural memory is equally important in understanding the neurobiology of tradition. Rubin (1995) rightfully points out that certain aspects of traditional performance seem almost automatic. This observation has been more formally expressed by Hymes (1975) in his consideration of “break-through into performance,” an observation that has also conditioned an entire generation of folklorists to focus almost

exclusively on aspects of performance. Clearly, there is a degree of nondeclarative—primarily procedural—memory that informs the performance of tradition which, in turn, is based largely on the consolidation and recall of declarative, episodic memories. Jones notes that “Ullman et al (1997) presents a dual model for language in which they posit that the lexicon is processed by the declarative memory system and grammar is processed by the procedural memory system” (Schumann, Crowell, et al. 2004, 124). By analogy, one might suggest that the episodic memory of events or learned events (e.g., narratives) are processed by declarative memory and the performance of those memories—including aspects of genre—are processed by the procedural memory system. Lee notes that “one acquires...[procedural] memory...through the repeated execution of a task...[it] is used for example when one learns how to play a musical instrument, how to dance, how to play a sport, or how to speak native language,” and to this list one could add how to tell a story, sing an epic, perform a jump rope rhyme and so on (Schumann, Crowell, et al. 2004, 44). The repeated execution of the task may take the form of both listening and performing; this learning process consequently engages both declarative and nondeclarative memory. In recall, the more stable nondeclarative memories structure the performance, while the more easily disrupted—yet potentially quite stable—declarative, episodic memories provide the content for the performance. Ultimately this approach allows for a holistic understanding of the neurobiology of tradition, al-

lowing for both variation and stability not only in the memory of individuals but also in traditional performances across individuals within a tradition group.

A chain transmission of a single story stands as an apt illustration of the potential for instability in tradition, particularly when members of the chain may be either inactive tradition participants, or completely unaware of the tradition (Anderson 1951). Unlike a regular tradition group, a chain transmission does not allow for the repeated execution of the task—neither telling nor listening. As a result, the memories created during the chain are likely to be more fragile and less likely to reflect the stability that is a hallmark of tradition. In a brief experiment, I asked twelve students in a folklore class to tell, in chain fashion, a version of “The Hook.” I told the story to the first person in the chain as follows:

C₀: I’m going to tell you a story called “The Hook.” Now this happened when I was a kid and I grew up in central Massachusetts in Worcester and just outside of Worcester. But I remember in high school, this happened to a couple of, of friends of mine. They had gone to a party and after the party they drove out to a lake that everybody would go to after parties, particularly couples, its called Lake Chagoggagogchagogg-agogch-abunagungamog. And it was outside of Worcester, and it was called Lake Webster. They had parked by the lake and they were sitting there discussing homework. They had the radio on, a little Meatloaf song was playing and they were really getting into

their discussion. Very hot and heavy in this discussion. He was very excited, they were going to get to a part of the homework, that he really thought was going to be great, but just then on the radio, a voice broke in and said that an inmate had escaped from Worcester State hospital which was the insane asylum in Worcester. And the way that you could recognize that this was the escaped inmate was that instead of a right hand, he had a hook, and so if you saw this man wandering about you should be very careful because what he liked to do, he liked to slash people with this hook that he had, and so the girl started getting very agitated, and said we have to go home, we have to go home, and he said, “No, no, no, we were just getting to the best part.” And she said, “No, no, no, I can’t stay out here, its too deserted out here, by the lake and I insist, you have to go home.” So finally after some back and forth, the boyfriend got very angry at her, and started up the car, and peeled out of the parking lot. Just you know burned a whole lot of rubber and headed off home to Worcester. And they didn’t talk the whole way home. But finally they go to her house and sort of as a gesture of chivalry, he decided to get out of the car, sort of as, you know, an ironic gesture, to show how much of a gentleman he was, he pulls up to the front of her house, and he gets out of the car, and walks around the car to open her door, and there, on the car handle is the bloody hook. So that’s the story.

Even though students who self-identified as eager storytellers were deliberately chosen to be the early links in the chain, after two links, the story had al-

ready begun to change significantly. Details fell away, and, more importantly, the motivation of the two young lovers to visit the lake all but disappeared:

C₃: Basically, there's this guy and he's in college and in Worcester, Boston, oh no, near Boston, Worcester? And he really likes this girl, and him and this girl they and park somewhere, in front of Lake Webster, which also has this really long complicated Indian name, but it's hard to pronounce, like Chamackamunga or something like that. And so, I don't remember it, and uh, anyway, so they're like sitting in the car and having this crazy conversation like talking about something that happened in class the other day and he's like really into it and everything like that, and I think there's some song from a band on the radio who they both like, or whatever, I don't remember the band name. I don't know who the band name is. Um, and all of a sudden, there's this interruption on the radio of this like this emergency announcement that there's crazed, deranged escaped mental patient in the area, right in the area they were in, and you know anyone in this area should leave immediately, and the only way you can identify this guy is he has a hook for his right hand I believe. And anyway the girl's like freaking out, like let's get outta here, let's get outta here, and so finally he's like OK we'll leave and they got to wherever they were going and cause he was a gentleman he got out of the car and he like walked around the car to go open the door for her to let her out and when he went to her door to go let her out, all he saw on the door handle was a bloody hook. And that's all I remember. That's it.

Despite the loss of various important features, the bounded phrases that define the underlying narrative structure are still in order, and the general notion of threat and its resolution have been maintained (see fig. 3 below). The last two links in the chain were, in contrast, reluctant storytellers at best, and the story quickly lost any coherence once it reached these students:

C₁₁: This was in Massachusetts somewhere. And um so there were these college kids and I guess they wanted to just go away for the weekend, so they were going to this lake kind of far away, they'd been driving all day and so while they were driving they, uh, someone on the radio came on, and they were like warning everyone, because this like insane murderer had escaped from like the mental hospital and it was just in that area where they were, so they uh, they decided that uh they should probably like turn around and go home. And when they came home there was a hook on the door of the car. And that's it.

C₁₂: OK. Well there's some college students who are from Massachusetts and they decided to go to a lake, and then they went to the lake. And they left their car I guess to go onto the lake for some reason. When they came back there was a hook on the car and they were very scared.

Some simple metrics can help reveal the rapid changes in length and word choice. Below is a table tabulating the most frequent verbs and nouns in the story, as well as a tabulation of total word tokens and word types for each narrative (fig. 2):

Fig 2.

Story/Noun	C₀	C₃	C₁₁	C₁₂
Worcester	6	(2)	(0)	(0)
car	5	3	1	2
home	5	(1)	2	(0)
lake	5	(1)	1	3
hook	4	(2)	1	1
area	(0)	3	1	(0)
band	(0)	3	(0)	(0)
door	(1)	3	1	(0)
girl	(1)	3	(0)	(0)
Story/Verb	C0	C3	C11	C12
was	10	2	3	1
had / has	6	2	1	(0)
go	5	2	2	2
said	4	(0)	(0)	(0)
were	4	2	5	1
called	3	(0)	(0)	(0)
remember	(1)	3	(0)	(0)
get	(2)	2	(0)	(0)
know	(2)	2	(0)	(0)
came	(0)	(0)	2	(0)
drive	(0)	(0)	2	(0)
Total word types	174	132	67	38
Total word tokens	428	306	119	57

Perhaps most striking is the rapid decrease in both word tokens and overall vocabulary. While the verb list shows little of interest, except confirming the past tense nature of the narration, the noun list does highlight some interest-

ing phenomena. Most obvious is the rapid disappearance of place-name referents—the story was deliberately set in a landscape that few of the students had experience with and, consequently, the very specific and unusual place refer-

ents disappeared almost immediately, to be replaced initially by more generalized place referents, and later to drop out altogether. Place referents in the network story were far more persistent (see below), both because they were well-known to the students, and because the students heard and performed the story numerous times, helping to fix the story-place link in their memories.

Another fairly straight forward comparison method between these stories is the isolation of what Labov and Waletzky (1967) term “bounded phrases.” Below is a small table that attempts to align the bounded phrases from each of the four variants in the order in which they appear in the stories. The last variant is particularly challenging, as the narrative bears little resemblance to the original narrative (fig. 3):

Fig. 3

C0	C3	C11	C12
friends of mine... had gone to a party			
after the party they drove out to a lake	[this college guy] and this girl... park... in front of Lake Webster	these college kids... wanted to just go away for the weekend	some college students... decided to go to a lake
they were sitting there discussing homework	they're... sitting in the car and having this... conversation	they were going to this lake	then they went to the lake
on the radio, a voice broke in	there's this interruption on the radio... this emergency announcement	someone on the radio came on... warning everyone	
an inmate had escaped from Worcester State hospital	there's [a] crazed, deranged escaped mental patient in the area	[an] insane murderer had escaped from... the mental hospital	
the girl started getting very agitated	the girl's... freaking out		
after some back and forth, the boyfriend got very angry at her	so finally he's like OK we'll leave	they decided that... they should probably... turn around	

[he] started up the car, and peeled out of the parking lot			
			they left their car... to go onto the lake
finally they go to her house	they got to wherever they were going	when they came home	they came back

Although the underlying structure – and the order of bounded phrases – remains constant across the variants, the degree of detail between each telling drops considerably. Of particular note is the complete disappearance of the complicating action of the story (the escape of the insane man, identifiable by his hook) in C₁₂ (Labov and Waletzky 1967). Clearly, for the chain story, the lack of any reinforcement mechanisms, coupled with the lack of cultural relevance for the students, doomed the story to significant instability and, ultimately, a degree of incoherence that would clearly prevent further telling of this story.

Anderson (1951), in his classic storytelling experiments, recognized the importance of network transmission – a situation that more closely resembles an active tradition community in which stories are told and retold by numerous storytellers. As an extension of my class’s chain experiment, we decided to develop a “seeded network” experiment in the following quarter, where I provided a story to two members of the network and then enforced a network transmission over the course of nine weeks with eight participants (fig. 4).

Students were asked to retell the story each time as best as they could remember it. Transcripts of the first telling and the last (fourth) telling of the story by a single individual provide an interesting comparison:

(A₁) So this guy moves out to Los Angeles to UCLA from the East Coast and he’s never been out here before and he doesn’t have a car and he realizes that he’ll need a car to get around because it’s Los Angeles and public transportation just really stinks here. So he’s looking through the paper and sees this listing that says brand new Porsche used for sale, for sale for 50 bucks and he knows that this is a typo but (...) “Ah, what the hell, I’ll call up anyways.” So he calls the number and “Oh, you’re calling about the car, fantastic, um, come on out for a test drive,” and he says, “Oh, sure.” So, you know, this is a once in a life time opportunity to drive a Porsche so he goes out to the address, this big estate in Beverly Hills, right 90210, right in the driveway is this glowing, brand new, red Porsche. And he can’t believe how beautiful the car is and wishes he could have it, but he knows it’s out of his price range. He figures, you know, I’d love to drive it anyway

Fig. 4

Week	Storyteller	Audience
1	A B	C and E D and F
2	C D	E and G F and H
3	E F A B	G and C H and D H and D G and C
4	G H C D	F and D B and C F and H E and G
5	E F G H	A and D B and C E and H F and A
6	A C G F	B and F D C and A A
7	B D E H	A and E B F and H D and G
8	E F C D	B E and G A and B A and C
9	A B G H	G H B E

so he knocks on the door. "Oh great, you're here about the car, let me show it to you, let me show it to you." He walks around, she shows him all the features, the interior design, the beautiful leather interior. "Well, do you want to take it for a spin?" So they hop in, he's driving around, driving for hours up and down the Coast Highway, and he just loves it. He knows the car is getting low on gas so he returns. He says, "Well, look, you know, it looks like I've used up all your gas, so I'll reimburse you for the gas but I, I really can't afford the car." And she says, "Can't afford it? But it's only 50 bucks! What do you mean you can't afford it?" "Well, gosh, I, I can afford that! Why are you selling it for so cheap?" And she said, "Oh, well, my husband left me for his secretary and I just got a wire from Barbados saying, 'Please sell the car and send me the money'."

(A₄) This friend of a friend of mine moved out from the East Coast to discover that here in LA it's impossible to get around without a car. But he's kind of a starving student so he doesn't have a lot of money to afford to buy a car. So he's looking through the paper and he sees this listing for this brand new Porsche for 50 bucks and he's like, "Ah crap, it's definitely a typo but, you know, I gotta go, I gotta go test it out, you know, I gotta go." So he hops on the bus, heads out to the address and it turns out to be this big mansion in Beverly Hills. So, so he knocks on the door, he notices that there's this beautiful, red Porsche out front, he says, "Oh, god, I would love to have that car, but at least I'll get to sit in it, I'll get to see it." A woman comes to the door, "Oh, hey, great,

so you're here about the car, fantastic! Let me show it to you." So they walk out, looks at it, opens the door, smells the leather and gets in. "Hey, you want to take it for a spin?" Says, "Oh yeah, sure, that'd be great." So, you know, they drive around Beverly Hills for a while and they take it on PCH, driving around for hours and he notices he's kinda getting low on gas so he, "Ah, well, you know, it's been a long time and we're low on gas," and he starts to bring the car back. So they pull in and he's like, "You know, I, I'm sorry, I'll give you, I'll pay you back for the gas, but you know I just can't afford this car." And she's, "You can't afford it? What do you mean? It's only 50 bucks!" And he's like, "Holy crap! Oh, ok, here I got 50 bucks." And so she hands him the pink slip, and he's thinking, "OK, I gotta know now that I can ask her." "So why are you selling the car for 50 bucks?" She says, "Oh well, you, my husband ran off with his secretary for Barbados and he sent me an email the other day saying sell the car and send him the proceeds."

These two story variants reflect many of the aspects of crystallization that I identified in an earlier study of paramedic narrative (Tangherlini 2003).

Similarly, the first telling in the network and the last telling in the network by different storytellers reveal equally interesting aspects of stability and variation:

(B.) So the story is, ok, a guy moves to LA and sees an ad for a Porsche Carrera and it's for 50 bucks. But he thinks that the K got left off of the ad and he figures what the heck I'm test driving cars anyway and I have time

to kill. So he call this 310 area code and a woman answers and says to come and test drive. The address is in Beverly Hills 90210 zip code and, uh, he takes the bus to Wilshire and Rexford and walks to this big, old house. It's a huge mansion--it has a circular drive way and there's a Porsche Carrera, cherry, it's bright cherry red and (...) and he takes the car. Test drives it with the woman. Goes on Mulholland, she doesn't seem to mind his driving very fast and he drives for... he drives to PCH... has gone for an hour and then they're gone for two hours and then when it gets to the point where he's low on gas, then he goes back to Beverly Hills. He says at this point, "I wish I could afford this car," and the woman is astonished and says, "What do you mean, you can't afford 50 bucks?" and so, not to scotch the deal, without saying anything anymore he gives her 50 bucks and she gives him the pink slip. But he can't resist asking why she is selling the car for 50 bucks. And she says her husband ran away to the Caribbean with his secretary and told her to sell the car and send him the money.

(G₄) So this is the story of a student who was from the East Coast and he comes to the West Coast and he's been told that, well, things are not like in New York, you cannot just hop into a bus or a metro here, unfortunately, you need a car. So he was looking in the newspaper for cars and he saw this ad for a Porsche for 50 bucks – he thought it was kind of odd, a Porsche at that price, but he said, "What the heck, why not give it a try?" and he called the person and see what's up. So he takes his bus, sorry, he takes his bike up to the Beverly Hills and

the address that corresponds to it is an absolutely gorgeous house. Very, very nice house, and in front of it there's this beautiful, red Porsche, the one that everybody dreams of. And then he goes up and there's this very nice lady who welcomes him and she offers him to take a spin. So of course they go and they go for a ride and it's the smoothest ride he guess he can have, it's just marvelous, he loves that and they drive for half an hour up to PCH and he's just in heaven, it's beautiful inside and then the gas is a little low, so he goes back towards the lady's address. And, um, at the time he has to take a decision to buy the car he says, "Well, I'm very sorry. I don't think I'll be able to pay for this car, I can't afford it." But the woman looks at him surprised, saying, "Are you mad? I mean, this is only 50 bucks! If you can't pay 50 bucks for a car..." and he doesn't ask more, just hands over a \$50 bill. She gives him the pink slip and later on, a few seconds later, he says, "Thank you very much for this but I'm curious to know why, uh,

this Porsche is so low in price." So the woman says, "Well my husband left last week with his secretary for Bermuda or those islands and he just sent a message, email or phone, saying, 'Sell the Porsche and send me the money'."

Not surprisingly, the network, with its multiple performances and multiple opportunities to hear the story – and thus reinforce the memory of the story – leads to a far greater degree of stability in the story. Again, the same short analytical illustrations as used in the chain story reveal a remarkable degree of stability across the network, a stability that aligns well with my study of crystallization in paramedic personal experience narrative (Tangherlini 2003). The word frequency table reveals not only a consistency within narrative repertoire (here narrator A), but across the network as well, both for word choice, total vocabulary, and length of narrative (measured in word tokens) (fig. 5):

Fig. 5

Story / Noun	A ₁	A ₄	B ₁	G ₄
Car	8	8	4	4
Gas	3	3	(1)	1
Porsche	3	2	2	5
Los Angeles	2	0	(0)	0
coast (PCH)	2	1	1	3
Interior	2	0	0	0
Bucks	2	4	4	2
Beverly Hills	(1)	2	2	1
Friend	0	2		0
woman/ lady	0	1	3	4

Ad	0	0	2	1
Story / Verb	A₁	A₄	B₁	G₄
know(s)	6	7	0	1
drive(s)/ driving	5	2	7	1
Afford	4	3	2	1
Says	4	3	4	3
Show	2	(1)	0	0
Notices	(0)	2	0	0
get(s)/ getting	2	4	1	0
go / goes	1	3	2	4
give(s)	0	1	2	2
take(s)	1	2	2	4
Total word types	163	170	136	178
Total word tokens	382	406	271	389

The stability within repertoire according to these criteria is particularly striking and obtains for all of the storytellers in the study.

A second comparison of bounded phrases is equally revealing. The align-

ment of phrases is much easier in this case than in the chain transmission. This stability can most likely be attributed to the reinforcement mechanisms of the network transmission of the story (fig. 6):

Fig. 6

A ₁	A ₄	B ₁	G ₄
this guy moves out to Los Angeles	friend of a friend of mine moved out from the East Coast	a guy moves to LA	student... comes to the West Coast
he realizes that he'll need a car to get around	discover[s] that ... it's impossible to get around without a car		he's been told that... you need a car

he's looking through the paper and sees this listing that says... Porsche... for sale	he's looking through the paper and he sees this listing for this brand new Porsche	sees an ad for a Porsche Carrera	he saw this ad for a Porsche
he calls the number		So he calls this 310 area code	he called the person
		a woman... says to come and test drive	
	So he hops on the bus	he takes the bus to Wilshire and Rexford	So he takes his bus, sorry, he takes his bike
he goes out to the address	heads out to the address	and walks to this big old house.	and the address
in the driveway is this glowing brand new red Porsche		it has a circular drive way and there's a Porsche Carrera	in front of it there's this beautiful red Porsche
he knocks on the door	so he knocks on the door		he goes up and there's this very nice lady who welcomes him
	he notices that there's this beautiful red Porsche out front		
she shows him all the features	So they walk out, [he] looks at [the car]		
they hop in, he's driving around... for hours	they drive around... for hours	Test drives it with the woman.	they go for a ride
the car is getting low on gas	he's kinda getting low on gas	he's low on gas	then the gas is a little low
so he returns	he starts to bring the car back	he goes back to Beverly Hills	he goes back towards the lady's address

He says, “... I really can’t afford the car.”	he’s like, “... I just can’t afford this car.”	He says... “I wish I could afford this car”	he says, “... I can’t afford it.”
She says, “Can’t afford it? ... it’s only 50 bucks?”	she’s, “You can’t afford it?... It’s only 50 bucks!”	the woman says, “What do you mean, you can’t afford 50 bucks?”	the woman [says] “Are you mad? I mean this is only 50 bucks!”
[He says] “I can afford that!”	he’s like, “... Oh, ok, here I got 50 bucks.”	he gives her 50 bucks	he... hands over a \$50 bill.
	she hands him the pink slip	she gives him the pink slip	She gives him the pink slip
Why are you selling it for so cheap?”	So why are you selling the car for 50 bucks?	But he can’t resist asking why she is selling the car for 50 bucks	he says, “... I’m curious to know why... this Porsche is so low in price.”
she said, “...my husband left me for his secretary	She says, “Oh well, you, my husband ran off with his secretary	she says her husband ran away to the Caribbean with his secretary	the woman says, “... my husband left last week with his secretary for Bermuda
and I just got a wire from Barbados saying please sell the car and send me the money.”	he sent me an email... saying sell the car and send him the proceeds.”	told her to sell the car and send him the money	he... sent a message... saying sell the Porsche and send me the money.

Although the word choice does vary (as noted in fig. 5 above), the overall structure of the story varies very little. Given this stability, with more retellings, it is likely that these storytellers would be able to pick up their stories at various points in the telling, without the need for a “running start.” The slight changes

in formulation both within and across repertoire suggest that the story is readily available to introspection during its retelling. Repeated exposure to the story of course leads to subtle changes in each telling, undermining the idea from the Standard Theory that, once consolidated, a memory is unlikely to be changed;

rather, here the environment of repeated telling and shifting information changes the underlying memory itself at the same time as it solidifies the pathways to that memory.

A clear limitation of these experimental observations is that they do not allow for an assessment of the ability of storytellers in the network to begin their story from points other than the beginning. Rather, the experiment simply confirms the widely-held notion that networks are better for maintaining stability of memory than chains. Although this begins to address the question of how people learn, store, remember and perform traditional expression, the premises of the Standard Theory could possibly account for these observations. Yet MTT provides a much better model for understanding the shifts within repertoire and across a network as hinted at in the above experimental data. It also does a much better job of accounting for change over time. The next step is to devise a network that allows for interruptions, yet requires the storytellers to continue their story with, or without, a running start. In such an experiment, one would probably need to split the storytellers into two groups. Group A would be allowed a running start and Group B would be asked to tell from where they believed they left off. If the discussion above concerning MTT and the “craftsmen of tradition” is correct, the experimental group would have to include several such “craftsmen”; as such, it might be difficult to find an adequate tradition group.

My brief experience as a neurosurgeon’s consultant obviously led me

down what I hope will be a fruitful path in understanding both the physiology and the neurobiology of tradition. Advances in neurobiology—and a move away from viewing the brain as a “black box”—now allow folklorists to consider the physiological structures and the biological processes that make traditional expression not only possible but guarantee that they will continue to be performed. Tradition, it turns out, is conditioned by processes of learning, memory consolidation, and memory recall. The recognition that every brain is different—both because of genetics and because of the dynamic impact of physical and social environment on the brain—fits well into a view of folklore as emerging from the dialectic tension between the individual and tradition. Understanding the neurobiology of learning and memory further clarifies the basis for stability and variation in tradition. MTT provides for a dynamism in long-term, declarative memory missing from the earlier Standard Theory of memory consolidation. Similarly, an understanding of the relationship between declarative and procedural memory explains the relationship between performance and text; to borrow from Alan Dundes (1964), there clearly is a neurobiological basis for texture, text and context. While it may be too early—or perhaps misleading or even wrong—to posit the notion of “tradition memory,” it seems quite clear that recent advances in understanding long-term declarative and nondeclarative memory also can help clarify intriguing phenomena with regard to the performance of traditional expressions that appear both during fieldwork and in the archive.

Notes

1. I would like to thank the participants in my fall 2005 seminar on folklore theory and methods at the University of California, Berkeley for their comments on earlier drafts of this paper. I would also like to thank my colleague John Schumann for his guidance and patience as I began learning about models of memory. Also, I would like to thank attendees at the Western States Folklore Society Annual Meeting at UC Berkeley in spring 2005 and the members of the Wildcat Canyon Advanced Seminars in Folklore for their comments on earlier versions of this paper. Finally, I would like to thank Anthony Buccitelli for his incredible patience as I completed this essay.
2. In earlier work I have proposed a refinement of von Sydow's concept of “active” and “passive” tradition bearers that incorporates an appreciation of the participatory nature of tradition, labeling the two nodes of this axis of participation “active” and “passive” tradition participants (Tangherlini 1994b).
3. Building on the work of Siikela (1990) I explore an example of this type of “crystallization” elsewhere (Tangherlini 2003). See also Anderson (1951) and Hiimäe and Krikmann (1992).
4. For an example of one such occurrence of disrupted storytelling see the opening sequence of “Talking Trauma” (Tangherlini 1994).
5. For a discussion of a similar experiment see Wehse (2005). Some of the earliest experiments in the reproduction of folk narrative were conducted by F.C. Bartlett at Cambridge in the early part of the twentieth century (Bartlett 1920).
6. I suspect that the paramedics with whom I worked might be an excellent group for this type of study (Tangherlini 1994b; 1998; 2000; 2003).

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Responses

Mix levels of analysis with care; genres not at all.

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From my reading, Tangherlini's chapter gets most things right. However, the chapter has two fundamental problems. When I was writing my book (Rubin 1995), I was lucky to be able to gain the ear of Albert Lord. One of the first things he said to me, once we got past the idea that memory was not all rote memorization, was, "Don't mix your genres." I repeated that mantra throughout my studies and it helped me prevent many potential blunders; I even used it as a quote to start a chapter. The first problem is mixing non-rhythmic, more literate genres with the rhythmic, more oral genres that I selected. As the chapter notes, expertise makes a difference; but expertise is different in different genres.

The chapter notes correctly that I describe and try to explain from the viewpoint of a cognitive psychologist only three genres, all of them rhythmic. I focused on these genres because the role of writing or other recording devices was minimal and usually viewed as a problem when it was used by the people I studied and by my most reliable sources. I wanted to look at the role of memory in the transmission of oral traditions and needed to minimize external memory aids, such as writing, that could act as prostheses to hide the limitations of memory. I could not see

how memory shaped the oral traditions if the traditions were not kept in memory. It turned out that in the three traditions I studied, as in many other oral traditions, there was little formal training. The expert singer sang and the novice singer listened. The novice then practiced without an audience, and then perhaps with one or sang the song back to the expert, who might say something like, "That is not the way I have heard it." The expert did not know the rules of the genre in a form that could be summarized and presented to a novice; the rules were simply followed. Lord (1960) makes this point repeatedly for his singers. I made it in my book and elsewhere (Rubin 1988).

Psychologists contrast contingency learning with rule-bound learning (for a discussion of differences in expertise see Rubin, Wallace, and Houston 1993). When rules are taught explicitly, learning is much more efficient and subject to conscious reflection of the kind that the chapter claims Arlo Guthrie uses. If one knows what a page of music looks like, and can have a discussion about poetic devices and music theory that benefits from a millennium of human intellectual activity, then one approaches music differently and one's expertise includes much that is not included in the expertise of someone who learns by observation and trial and error. The two kinds of learning lead people to produce different kinds of songs in different ways. In a study of the very early beginnings of expertise, we had extremely literate undergraduates learn five similar oral tradition ballads by simply listening to them without any formal teaching of the

ballad form (Rubin, Wallace, and Houston 1993). They learned each successive ballad better over the course of the five ballads, following more of the regularities of the form and content. At the end, they composed a new ballad that was supposed to be indistinguishable from the five ballads they had learned and then to try to state the explicit rules that the ballads followed. They stated, but did not follow, some rules including, “the protagonist dies.” They followed, but did not state, rules such as “ballads have no explicit settings,” “ballads are composed of mostly one and two syllable words,” “nouns in ballads are concrete and easy to visualize, rather than abstract.” Their literate college training led them to notice explicitly one kind of regularity; their observational learning led them to produce another.

How did Arlo Guthrie get to the point where he sang *Alice’s Restaurant*? It is doubtful from the information in “The Official Oughtabiography of Arlo Guthrie” (<http://www.arlo.net/bio.shtml>) that it was from pure observation without any more active teaching. The line from *Alice’s Restaurant* quoted in Tangherlini’s chapter, “So we’ll wait for it to come around on the guitar, here and sing it when it does” is probably not a spontaneous creation of an oral tradition singer of tales. Guthrie registered his ownership of the entire talking blues monologue, including that line, in addition to the sung portion of *Alice’s Restaurant*, (<http://www.arlo.net/resources/lyrics/alices.shtml>).

Moreover, the performance from which the recording of the monologue came would hardly be the time to make

up such a long monologue without prior practice.. Arlo Guthrie wanted to involve a large audience at Newport, including me, and so he did have to keep playing until it came around or he would have violated genre and performance expectations in a way he could not, even if he had the ability to skip ahead. Imagine the jarring effect on the audience if he had jumped from where he was playing to the note he needed to start singing instead of continuing to play until it came around. Even a classical musician “craftsman” soloist, who could start reading the score at any note, returns to the beginning of a movement if a string breaks. The next time Arlo Guthrie wants the audience to join in, he adds the accurate, humorous, and copyrighted “We’re just waitin’ for it to come around is what we’re doing.” Such are the talking blues. I will let pass why the audience laughed, but there are more possible reasons than the one given in the chapter.

Arlo Guthrie was, and is, a master of the genres in which he works and these depend, in part, on text that is documented and revised by use of external memory aids, such as audio recordings, and written notation. Musical notation, recording, and writing can play a major role in some genres. Perhaps Tangherlini’s figure of levels of expertise may be correct for these genres: I remind the reader of Lord’s cautionary “Please don’t mix genres.” I have every reason to assume that the British singer with whom I spoke, who was brought to Duke University for a British-American festival, was an expert and a “craftsman” and that what he said was the actual

truth. Yet he maintained that it was necessary for him to wait until the chorus came around in order to sing the words. When Bruce Kapferer asked one of his expert performers to inform him about a demon and the singer had to sing to the part where the demon was mentioned, we had no reason to doubt him (Rubin 1995, 190). In these oral traditions, experts need a running start. As such, the figure in the chapter will need a different size box for “cue-item discriminability very important” for different genres.

The second problem in Tangherlini’s chapter is more serious. When I started studying oral traditions, I was a young cognitive psychologist with a good working knowledge of the brain as well as of behavior. This knowledge made its way into the organization of my book. The topics of narrative (or theme), language in the form of poetics, and visual imagery are in separate chapters, and object and spatial imagery are separated within the visual imagery chapter. Each of the behavioral systems has its own neural system that had been mapped out in terms of anatomy and that we have long known could be damaged separately. As I reviewed in my book, students of oral traditions had made most of these distinctions without help from psychologists or neurologists. However, I found that the distinction between spatial and visual imagery and the idea that narrative could exist without most of what we call language, were novel ideas to many scholars in the humanities. Although most humanists studying oral traditions view visual imagery as a single system, spatial location (the “where system”) and object recognition

(the “what system”) are considered as separate based on behavior studies, on neuropsychological damage studies, and on neuroimaging studies (Rubin 1995, 2006). Similarly, there is good evidence to consider narrative as a mode of thought (Bruner 1986) that need not depend on language, that can be used without language, as in mime and cartoons, and that has a different neural location that can be damaged separately (Rubin 2006; Rubin and Greenberg 2003).

In the book, I downplayed the neural basis of behavior and concentrated on the behavioral level that I felt then and still feel now is the most relevant for students of oral tradition. It is not because researchers viewed the brain as a black box, as the chapter laments; it is a question of determining the most appropriate level of analysis. What I wanted to explain was stability and change in oral traditions. I wanted the clearest theory that could do that. Although I was informed by what was known about the brain, it did not make the theory more precise to try to reduce it to underlying neural mechanisms. To use a concrete example, I knew from anatomy, neuropsychological damage studies, and neuroimaging studies that two behavioral systems important to oral tradition, visual imagery and language, were located in different neural systems. We have known they were separate systems with different properties at the behavioral level since the time of the ancient Greeks. However, labeling the brain locations involved in each system, or the use of any of my other knowledge at the neural level, did not tell me anything important enough to put into the book

about how oral tradition is transmitted. Later, I went into more detail about the brain-behavior analysis of the basic systems of episodic memory on which oral traditions draw (Rubin 2006) – but this still did not add anything that would tell me about stability and change in oral traditions. As is often the case, what is known about the brain has no implications for the kind of theoretical distinctions the author wants to make about behavior.

As a counterpoint to Tangherlini’s claims, I wish to examine some of the more detailed critiques of my work that his chapter brought forth and in particular show the difficulties of moving from neural to behavioral theories. The chapter contrasts the Standard Theory with the Multiple Trace Theory. The Standard Theory is not so standard as it is presented to be in the chapter and the Multiple Trace Theory is not so different from it. There is general agreement in the field that the hippocampus binds information in many other parts of the brain at the moment of encoding. There is some disagreement as to whether later declarative recall requires the hippocampus. However, this is not a major issue for most behavioral studies of memory and has absolutely no implications, as far as I can tell, for behavioral theories at the level I presented them in my book or that are used in the chapter. The key question here is what we could learn about oral traditions if we knew from the Multiple Trace Theory that cues arriving from sensory, language, and emotion areas of the brain had to pass through the hippocampus before activating networks or associations in other

parts of the brain that form a memory. How would that be different from what we would learn if the areas interacted among themselves without involving the hippocampus, which would be the neural alternative? That is, would this information affect what we know about theories of performance, or in any way restrict the range of possible behaviors in intact human beings? I can think of none, given our current level of knowledge. Even when we wrote papers on the catastrophic effects on memory of brain damage that removed visual memory abilities, there was no need to enter this debate (Greenberg, Eacott, Brechin, and Rubin 2005; Greenberg and Rubin 2003; Rubin and Greenberg 1998). Contrary to what the chapter implies, the key role of multiple cuing and cue-item distinctiveness as developed in my book would rely on information in multiple areas of the brain if the brain were involved in an explanatory role. That is one reason why there were separate sections on narrative, language, visual imagery, and spatial imagery. However, for the book, naming multiple systems of the mind sufficed without specifying in detail the neural basis of each of these systems in the brain. The discussion of Hintzman’s instance model (1986) in my book is of a computer model of behavior that is as close to the neural level Multiple Trace Theory as one could get, and I considered it as one possible way to implement my theory on a computer. The model hypothesizes multiple traces, just as the neural model does, and makes predictions about behavior based on the multiple trace – it simply remains silent on where in the nervous system the traces can be found.

Thus, even when Tangherlini's chapter is right about the neural basis of behavior, what it brings from the brain makes no difference in considering how one would describe and explain behavior. What we know about the brain can inform our theories of behavior, but making this connection is not always easy. To put this most simply, one should always try to make use of all levels of analysis, including the cultural, psychological, and neural levels. However, in the case of oral traditions, or of Arlo Guthrie's singing, using the Multiple Trace Theory at the neural level adds no useful information.

What do we know about the relation of brain and behavior that would be applicable to oral traditions and how has it changed in the decade since my book was published? I think it is safe to say nothing basic has been contradicted, but that the rise of structural and functional neuroimaging has offered a great deal of new information. From structural neuroimaging, we now know that the brain changes in relation to expertise; further, we can now measure that change in some detail. From functional imaging, we know which areas of the brain are most active in various tasks. For instance, from my own work on autobiographical memory we know that when people have to judge whether a picture is one they took themselves rather than one they saw in the laboratory, they utilize more areas involved in spatial processing, in self-referential processing, and in recollection, including the hippocampus (Cabeza, Prince, Daselaar, Greenberg, Budde, Dolcos, LaBar, and Rubin 2004). We also know that in the

course of recalling an autobiographical memory, the hippocampus is involved early in the search process but becomes less active as the memory is retrieved and visual areas become more active (Daselaar, Rice, Greenberg, Cabeza, LaBar, and Rubin 2008). Neural imaging work is expensive and those who provide the funding are generally more interested in practical problems of health than in oral literature, so the experiments available for review do not investigate oral traditions. Thus, it is hard to recommend any summaries integrating the neural findings directly with work in oral traditions, though I have made some attempts (Rubin 2006).

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Response

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The article “Where was I?: Personal Experience, Crystallization and Some Thoughts on Tradition Memory” addresses a number of fields of research, including neurobiology, neurophysiology, and memory. By placing research from these fields in the context of field research in folklore studies the author’s work also potentially has implications for many other disciplines, including cognitive psychology, anthropology, folkloristics and literary studies.

By alluding to this theoretical background the author adopts an interdisciplinary stance and focuses on “tradition” from a folkloristic-neurobiological perspective. He sets out to pinpoint the “neurophysiologic processes of tradition” (42), or, as I understand it, he seeks to discover where tradition is stored in the brain and what characterizes the neurobiological processes of tradition in contrast to other kinds of memory performances.

Although the questions mentioned above are enough to fill many books with their responses they are but a few of the issues raised in the opening pages of this thought-provoking article (42–43). While some of the questions have vast implications and others are more focused and idiosyncratic they all share the same motivation: to delineate between the role of biology on the one

hand and socio-cultural circumstances in regard to the term “tradition” on the other hand. It is thus out of necessity that the author states that he wishes to “speculate briefly on these questions” (43). Inevitably speculations abound while answers or “tentative suggestions” (as the author calls them) are fewer.

It could be said that the question is perhaps a better friend of science than the answer or the firmly-grounded suggestion. Surely everything hinges on the value or relevance of the question. Is it a good and timely question or a confusing and vague one which potentially can even lead astray? I would like to address the nature of the questions boldly put forward by Timothy R. Tangherlini and refer briefly to his article’s theoretical framework. Although the questions raised are potentially in line with Neisser’s call (1978) to researchers to focus on the relation between the theoretical and the practical questions in cognitive explorations of memory, the theoretical uncertainties on which these questions are based are vast and deserving of attention.

The first obvious problem is the term “tradition” as it emerges from the questions asked by the author. For a start, one wonders about the author’s understanding of the term. He mentions Parry and Lord’s “singers” and the folk singer Arlo Guthrie, so a kind of folksong or a folktale tradition is seemingly implied, while the author’s empirical study focuses on “folkloric data” (i.e., tales transmitted by students). The author investigates the “possible” specific nature of “tradition memory” compared with other kinds of memory, language

learning, or the acquisition of other “habitual skills.” This leads the author to the central question, namely, “...if tradition too might be linked to special mechanisms – or even specific sites – in the brain” (42).

As I see it, one is obliged to begin research by defining the object of investigation or even arguing that an object *exists* in itself. Certainly this is a prerequisite for attempting to “place” it or to describe it in relation to other objects. Thus there is, to my knowledge, no empirical or scientific study in any of the academic fields mentioned above that claims that human memory can be classified or categorized when it comes to the actual cognitive processes of memory. The memory of, let us say, a traditional folksong cannot be seen as using a different site or a different set of neurobiological or cognitive processes in the brain than, for example, the memory of a Britney Spears pop single. Therefore, it is indeed difficult to claim that semantic categories (“tradition,” “pop culture,” “mathematics,” etc.) can be distinguished from one another when it comes to the complicated and simultaneous cognitive and biological processes involved in the process of memorization or recollection. Cognitive psychologists humbly admit that, rather than being a single cognitive process or system, memory is a collective term for a family of neuro-cognitive systems that store information in different formats (Schacter, Wagner, and Buckner 2000; Tulving 2002). Interestingly, our understanding of metaphors is leaning in this direction with the aid of conceptual integration theory, often referred to as “blending.” The construc-

tion of meaning is seen as a simultaneous gathering of many processes in the so-called blending space (Fauconnier and Turner 2002).

Today, there exists to my knowledge no overarching theory that can draw together the experimental results of neurobiology or neuropsychology on the human brain with studies of cognitive psychology on memory. This problem would have been a solid and appropriate starting point for the questions put forth in the article. Indeed, the vastness of the memory discipline make great demands on those who represent interdisciplinary research on the issue, as Tangherlini does in his article.

Thus, while the author asks “to what extent is tradition conditioned by neurobiology and genetic inheritance and to what extent is it conditioned by environment?” (43), cognitive psychologists would consider it impossible to distinguish between these aspects of personal memory. In fact, they would claim that it is a relatively misleading metaphor to say that a brain *thinks* or a brain *remembers*. It would be more accurate to say that a *person* thinks and a *person* remembers by using the brain as one of the tools involved in the process. This is because other aspects of memory – among them cultural, social, spatial, and sensual surroundings – cannot be neglected without creating a false picture. When it comes to describing the process of memorization in cognitive psychology the distinction between brain biology and socio-cultural circumstances of memory is non-existent. Any distinction of this kind made in speaking of cognition is merely a practical one, one that allows

scholars and doctors to pinpoint certain aspects of brain functions. The tools that cognitive psychologists employ in their attempts to understand memory are mainly metaphors and analogies, and the nature of metaphor—highlighting certain aspects of things while hiding others—should not be forgotten. One could mention, for example, the theatre metaphor, the multiple store metaphor, and memory as archaeology as some of the most popular metaphors for memory (Magnussen et. al. 2007). Underlying the use of metaphors in place of other “more scientific tools” is the fact that memory is *not directly observable*. Thus, when the author criticizes David Rubin for introducing memory as a “black-box phenomenon” while failing to explore “the actual processes by which memories are consolidated” (45), I can not say I agree, since memory still **is** a kind of “black-box phenomenon” because of its theoretical implications and complexity, or, to use another metaphor: too vast and complicated a theme for the *episteme* of putting things into boxes or categories.

Of course, it is true that if certain locations in the brain are damaged, for instance, by trauma or by a tumour (as in the case presented in this article), the patient can be left incapable of performing certain cognitive tasks, such as smelling, speaking, or recollecting childhood memories. Cognitive scholars have stressed, however, that this does not justify locating the complicated process of memory (or other cognitive tasks) in certain isolated parts of the human brain. Yet, this is what the author appears to do when he refers to the surgeon who wanted to avoid “cutting out” the pa-

tient’s Danish (41), or when he goes on to wonder if “tradition too might be linked to special mechanisms—or even specific sites—in the brain” (42).

The author goes on to suggest a characterization of the “craftsmen of tradition” as those who are not dependent on “cues.” Cues for memory can be rhythm, or a song, or even imagery, as also mentioned by Rubin (1995). In other words, he suggests that “masters of tradition” have a different method of memorizing than others in as much as they do not use cues for this purpose (pp. 45 and 46). If, for a moment, I might be excused for bringing into this discussion some personal empirical experience, I would like to mention that for about twenty years I have participated in an assembly of the folksong tradition (*rímur*) in Iceland as an active chanter. There is nothing in my experience that could support the above-mentioned idea; the rule is the same for the experienced as for the inexperienced chanters: the melody, once mastered, prompts the recollection of the words of the stanza. I have argued that in the pre-Christian North singers used bizarre imagery to aid in the recall of abstract words. This notion suggests that, in pre-Christian times in Scandinavia, there existed an advanced mnemonic system that faded away with the establishment of writing (Birgisson 2008). In this light, the mastery of tradition could be described as cultivating the skill of using cues, as seems to be the case among people with advanced memory skills (Luria 1975). This would suggest that “masters of tradition” use the same memorization method as the rest of us.

The author’s reference to a neurobiological study that claims that “brains are as different as faces” (47), leads him to the assumption that different people learn and remember differently, which in turn leads him to suggest that this difference in human cognition “may help us understand how tradition persists” (47). Could it not also be said that tradition exists namely because the opposite is true (i.e., that people have something in common both in the way they think and in the way they construct meaning from everyday life)? The author’s approach seems to associate tradition with a kind of biological elitism (i.e., those active in tradition have special kinds of brains), while it unfortunately excludes the social and cultural aspects of tradition.

In the light of this hypothesis it was rather odd to read the presentation of the empirical study involved: “A chain transmission of a single story stands as an apt illustration of the potential for instability in tradition, particularly when members of the chain may be either inactive tradition participants, or completely unaware of the tradition” (15). When it comes to a tradition, the transmission of poems, songs or folktales, for example, this seems to be an inappropriate model since tradition only requires a handful of active participants for its survival for an extended time. Temporal and locative aspects are also theoretically significant in this context. What type of people and what kind of tradition are involved? In addition when and where did the tradition in question exist?

These questions have to be answered since the art of remembering and telling stories has formerly had, and indeed still

has, different statuses in different societies. The status of these aspects among modern western people is apparently neither representative of the rest of the world nor of earlier times. It is therefore hardly representative of the brains of the “craftsmen of tradition.”

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