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HUMAN MEMORY AND THE SAYINGS OF JESUS

Contemporary Experimental Exercises in the Transmission of Jesus Traditions

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For years, as a pedagogical exercise in parables as metaphor, I have asked my students to listen to my own parable, the "Parable of the Lottery Ticket." I use this exemplar in class because its internal references are contemporary, allowing the meaning of the parable to easily emerge as metaphor rather than allegory. I recite the parable exactly the same each time I perform it, as follows:

> The kingdom is like a young woman who found a lottery ticket in the street. The next day, when the numbers were posted, she won twenty-four million dollars.

What the students do not know is that I have another pedagogical objective when I ask them to listen carefully to this parable: I want to make concrete for them the role of real-life memory and its effect on the transmission of Jesus' sayings. So, at the beginning of the subsequent class period, I ask my students to take out a blank piece of paper and reproduce in writing the parable of The Lottery Ticket as accurately as they can. Of course, students offer the normal objections, several typically pointing out that I did not tell them that they needed to "memorize" the parable, before they settle down to the task. In only a few minutes, they are finished. Without another word, I collect their papers.

The next class period, I show them a chart that reproduces their versions of the parable side-by-side with the original. The entire class period is filled with howls of laughter at the twenty-five versions that are displayed. Not a single student in any of my courses has ever replicated the parable

exactly, although most students have faithfully reproduced the "gist" of it. This has never been a big surprise to me, since all the classic studies in orality have demonstrated again and again that the reproduction (equals *R* throughout this essay) of a story will maintain the overall meaning of the narration while sacrificing the verbiage and details (see Parry 1971; Lord 2000; Havelock 1963; 1976; Ong 1967; 1971; 1982; Foley 1991; 1995).

What I have experienced in my classroom is summarized well by Kenneth Bailey, who writes about his own experience within the oral culture of the Middle East (Bailey 1991). Bailey describes three types of transmitted materials, the most inflexible being proverbs and poems, which are often remembered verbatim, and the most flexible being jokes and casual news, which "float" and "die" in a state of "total instability" (Bailey 1991, 44). He says that the transmission of the remaining materials—including parables and historical narratives—was accomplished with "continuity and flexibility," not "continuity and change." This continuity with flexibility works to "control" the transmission of the material. Bailey could be writing about my classroom exercise when he writes about his own experience in the Middle East as follows.

> Continuity and change could mean that the storyteller could change 15% of the story—any 15%. Thus after seven transmissions of the story, theoretically *all* of the story could be changed. But *continuity* and *flexibility* mean that the main lines of the story *cannot* be changed *at all.* The story can endure one different transmission through a chain of a hundred and one different people and the inner core of the story remains intact. Within the structure, the storyteller has flexibility within limits to "tell his own way." But the basic story line remains the same. By telling and retelling, the story does not evolve from A to B to C. Rather the original structure of the story remains the same but it can be colored green or red or blue. (Bailey 1991, 45)

The Role of Memory in Orality and Scribality

This relatively simple classroom exercise has gradually eroded my confidence in traditional approaches to and explanations of the similarities and variations among the early sources for Jesus. The fact that traditional methods and models are highly problematic is not a new insight. Werner Kelber's *The Oral and the Written Gospel* (1983) was bold and pioneering for many reasons, among them his criticism of the traditional model of literary dependence and the traditional methods of biblical studies that created it. Kelber's book pushed scholars to start remapping the oral/scribal culture and consciousness that dominated the ancient world and to work out its implications for the transmission of traditional material, including the words of Jesus. My classroom parable experiment, however, highlights an enormous facet of orality and scribality that has yet to be taken seriously by biblical scholarship: the role that human memory plays in the process of transmission in rhetorical cultures dominated by orality. In other words, *how* did human memory affect both the transmission and preservation of stories about Jesus and sayings attributed to him?

When I began prodding the research literature for answers to this question, I was disappointed to find that psychological models have not been incorporated into biblical studies to the same extent as anthropological, sociological, and literary models. Further, I found only one article, published by Robert McIver and Marie Carroll (2002; 2004), in which biblical scholars report the results of psychological experiments that they themselves have conducted to elucidate the traditions of Jesus. McIver and Carroll asked student subjects to reproduce, orally and in writing, various secular narratives, jokes, and aphorisms that were presented to them. The researchers concluded that direct literary dependence or copying is likely in the biblical sources in cases where eighteen or more words are found in exact sequence, with the exception of aphorisms, poetry, or lyrics, which tended to be remembered and repeated with very little variation.[2] Orally transmitted narratives evidence a high percentage of common vocabulary, but words found in the exact same sequence generally appear only in short phrases. McIver and Carroll observed shifts in the tenses and mood of verbs; often synonyms were substituted. When applied to the synoptic problem, McIver and Carroll found eighteen parallel passages in which there are eighteen or more words in exactly the same sequence and grammatical form.

Objections to McIver and Carroll's research have been raised.[3] The biggest question surrounding their work is whether such an experiment can produce valid conclusions about ancient documents given our vast distance from the ancient people. This is the objection of anachronism, since only modern people can be the subjects of such memory experiments. But though the problem of anachronism should be kept in mind, it should not rule out further experimentation. Nor should it be used to justify the marginalization of information on memory generated by psychologists who use contemporary people as their subjects. In particular, the appeal to anachronism should not be used by biblical scholars as an excuse to continue theorizing without also conducting their own field research. We will not know the results of our experimentation until we conduct our own experiments—whether it will reveal striking similarities or differences when compared to our ancient sources. If the results of such experiments

are compatible with the evidence from the ancient literature, then the long distance between modern subjects and ancient people may not be as insurmountable as might first appear.

To say the least, it is lamentable that biblical scholars have not readily embraced psychological theories or methods, especially given the fact that Jesus traditions were fixed in human memory long before a single word of Jesus was scribed down. Again and again, the available sources clearly state that the composition of ancient Christian documents involved "remembering" the words and deeds of Jesus.[4] Even after their initial scribing, these traditions continued to be performed and transmitted without the aid of texts. Thus, the written texts were affected by human memory, since their scribing may have been based on the memory of a performance or a remembered version of another text rather than on direct copying from a written manuscript. This being the case, a successful understanding of the ways in which Jesus traditions were transmitted will require a firm grasp of how the human memory operates.

Studies in the field of cognitive psychology have demonstrated that human memory has a double nature, like the two sides of a coin. One facet of memory is its *instability,* its tendency to distort and forget. The other is memory's tendency toward *stability,* its ability to preserve and to reconstruct with accuracy. Memory's dual nature must be faced if one is to explain the multiformity of the Jesus traditions.

The Instability and Stability of Memory

The subject of memory distortion is its own field within cognitive psychology. The literature is vast, written mostly after 1970, and much of it has focused on "false" memories (see Roediger and McDermott 2000, 158–60; Loftus, Feldman, and Dashiell 1995; Ceci 1995; Loftus 1998). Since 1980, a large amount of research on memory distortion has explored the interface between neuroscience, neuropsychology, and cognitive psychology (Schacter 1995, 14). Studies on errors of commission generally try to explain *why* memory distorts rather than *how* memory distorts (see especially Roediger and McDermott 2000; Schacter 1995). Researchers have found that many factors combine to distort memory, including the "relatedness effect." If people experience something that strongly relates to something they have already experienced, their memories of these two experiences will affect one another. "Interference effect" is similar. It has been demonstrated that events immediately before and after an experience will affect the recall of that experience. "Imagination" plays a strong suggestive role, affecting recall to the point that people sometimes "remember" imagined events as if they were physically experienced events. Psychologists have also explored memory effects in terms of guessing, social factors, and differences between individual subjects (Roediger and McDermott 2000).

Since this article is focused on *how* memory distorts information rather than *why*—that is, how Jesus traditions were shaped rather than why the early Christians remembered the way they did—most of the psychological research is of limited value for the present study. One psychological study, however, stands out from the rest, because it was conducted in conditions as natural as possible using complete narratives rather than laboratory lists, strings, or patterns. I refer here to the classic series of experiments conducted by Sir Frederic C. Bartlett and published in 1932. Bartlett wanted to determine how memory affects the reproduction of a presented narrative (Bartlett 1932, 63). In order to explore this thesis, he asked a series of students to read twice a short North American folktale and then reproduce it. Bartlett noticed that the folktale became significantly shorter, until it condensed to a bare skeletal outline. After only a few *R*s, the story began to develop a fairly fixed form—concise, concrete, and undecorated. Original details vanished, and new details replaced them, details that were more meaningful to contemporary culture and society. Synonyms were substituted so that more familiar words replaced the less familiar.

Bartlett observed that his subjects remembered a general scheme, form, order, and arrangement of material, even the general impression of the story. But the actual style and verbiage of the original was rapidly transformed. The farther away in time from the original presentation, the more the subjects elaborated and invented new material. Hermeneutical insertions and moralizing tendencies that brought the story into the subject's own experiences and sensibilities were quite common. Other than general impression and structure, the repeated *R*s retained the setting of the story and a few outstanding details, particularly words or phrases that were prominent. The accuracy of a *R* in terms of precise construction of words was a rare exception, not the rule. Further, although the tendency is for the unusual to be denuded or erased, there are two sets of conditions in which Bartlett found it more likely to be maintained: when the novel feature is the single unusual element of a bland story or when the novel feature is repeated several times in the story. Occasionally, Bartlett noticed a transposition in the order of elements: things the person identified with emotionally would move to the front of the sequence. For the most part, however, the order and number of events remained constant.

From these and other experiments, Bartlett surmised that human memory is (re)construction and that this (re)construction is a social act.

This being the case, one must discard the view that memory recall is a matter of "fixed and changeless traces." Recall, in fact, includes more than what we actually perceived. Humans remember by filling in the gaps with experiences from other similar situations or with what they believe suits the occasion. So, recall is in part imagining, with the details being drawn from many sources. Memory does not correspond to simple experience not only because memories are constantly mingled with constructions but also because they are, in fact, "constructive in character" (Bartlett 1932, 128). Bartlett concluded that memories are imaginative reconstructions of the past, largely influenced by preexisting knowledge structures ("schemas").

Referring to Bartlett and other cognitive psychologists (cf. Allport and Postman 1947), David Rubin laments in *Memory in Oral Traditions* that our knowledge of memory has come from experiments in which memory performance was not impressive (Rubin 1995, ix). When Rubin began reading in the field of oral traditions, he found that oral traditioning was "a case where memory worked extraordinarily well" (Rubin 1995, ix). As an experimental cognitive psychologist, Rubin became fascinated with studies in orality and has attempted to explain the stability of oral traditions after generations of transmission by word of mouth.

When Rubin talks about the "stability of oral traditions," he does not necessarily mean that oral transmission preserves exact verbatim recall. Although verbatim recall can occur in orally transmitted material, it is usually tied to genres like lyrics and rhymes, which include embedded memory aids (rhythm, counting, music). But even these genres are subject to variation, as Rubin demonstrates with the common English rhyme *Eenie Meenie,* eighty-two versions of which are known. Although Rubin understands oral tradition to be remarkably stable and conservative, he does not understand this stability in terms of long strings of words reproduced verbatim. He points to the work of Hunter, who has shown that there are no documented cases of oral *Rs* where over fifty words are recalled verbatim, except where a written record is available to the performer. Rubin therefore concludes that long verbatim recall requires a record other than human memory (Rubin 1995, 6; cf. Hunter 1984, 425–40; 1985, 207–35). Rubin thinks this flexibility of the tradition aids in its long-term stability and retention, because the variability allows each performer to develop an easier-to-recall variant adapted to the performer's taste and to the audience or culture. This increases the likelihood that the material will be preserved by the new generation rather than forgotten (Rubin 1995, 6–7).

Rubin concludes that a specific "variant" of a unit is not being transmitted. Rather, the oral performer transmits "the theme of the song, its imagery, its poetics, and some specific details" (Rubin 1995, 7). Oral traditions survive because they develop certain strategies and forms of organization, including meaning structures and patterns of sound, that work to stabilize human memory and decrease the types of changes that naturally occur when material is transmitted more casually.

This development of material into an oral tradition is particularly important to the present study, which is focused on the initial decades of the transmission of Jesus traditions—traditions that had not yet become stable oral performances with a long history of intergenerational transmission or stable scribed copies. Although oral traditions tend to stabilize eventually, their origin and first years of transmission are not stable. Until the early Jesus traditions began to be scribed down, they were fixed only by the accuracy of human memory. Even a casual analysis of the variants of Jesus' sayings found in the early Christian literature demonstrates that, until the Jesus traditions began to be perceived as Scripture and canonized, their oral and scribal transmission was susceptible to exactly the types of alterations demonstrated in Bartlett's lab and my classroom.

So how does oral material come into a stable form that can be passed from one generation to the next with only slight variation? The answer to this question lies at the intersection of Bartlett's and Rubin's theories. The formulation of the material as it is initially reproduced would mold the story into a concrete, formulaic, and conventional script, a form acceptable to the social group transmitting the material. Once this is done, the material would take on a shape that is easily recalled orally across generations (see Rubin 1995, 130–32). It is important to recognize, however, that the oral recollection and transmission of the conventional material would continue alongside its scribing and that the reshaping of the conventional material would have continued within the scribal context until the text took on scriptural status and was canonized.

Two Pilot Experiments

In order to begin to address the problem of the operation of human memory in the transmission of Jesus traditions, I conducted a series of real-life memory exercises in consultation with Professor Jean Pretz, a cognitive psychologist at Illinois Wesleyan University (Bloomington). Although the experiments were controlled, the results were based on the responses of only forty-four subjects. My goal was modest: to conduct two short pilot experiments and then determine if my results warranted further experimentation on enough subjects to generate more-significant statistical data.

Four specific questions informed my experiment. First, are there characteristic memory distortions (instabilities) and verbal agreements (stabilities) that occur in real-life recall that likely affected the process of passing on traditions about Jesus? Second, what are the variations and verbal agreements that arise in different media environments: oral to oral (OO); oral to written (OW); written to oral (WO); written to written (WW); written sources retained (WSR)? Third, do certain memory distortions and patterns of verbal agreement occur in certain of these modes of transmission? Fourth, what might these memory distortions and patterns of verbal agreement mean for our understanding of source dependence and composition in the ancient world?

My subjects consisted of student volunteers between the ages of eighteen and twenty-two. All were studying at Illinois Wesleyan University and chose to participate in the experiment as an optional class assignment. They were randomly assigned to one of the four media environment groups described above. Their membership within their assigned groups remained constant throughout the course of the experiment. The subjects were asked to complete a questionnaire for control purposes and to read and sign an informed consent. Twenty-four were female, twenty male. Their degree concentrations varied widely: Art (2); Biology (1); Business (6); Chemistry (1); Computer Science (1); Economics (1); Elementary Education (3); English (3); Greco-Roman Studies (1); History (3); Math (2); Music (3); Music Education (2); Music Theatre (2); Nursing (1); Philosophy (1); Political Science (3); Psychology (3); Religion (7); Theatre (1); Undecided (3). All students had taken at least one religion course previously.

The first experiment was explained to the subjects in these terms: "You will be asked to listen and/or read some proverbs, parables, and short narratives. Then you will be asked to speak into a tape recorder and/or write as accurately as possible what you have heard or read."

- *Group 1: Oral to Oral.* Subjects listened to an unfamiliar, tape-recorded male voice that instructed them: "Listen attentively to this saying. I will repeat it three times." After listening to the recorded saying three times, the subjects were instructed to immediately take a tape recorder into a private room and "repeat as accurately as possible the saying you just heard."
- *Group 2: Oral to Written.* Subjects listened to the same tape recording with the same instructions: "Listen attentively to this saying. I will repeat it three times." After listening, the subjects were instructed to immediately "write down as accurately as possible the saying you just heard."
- *Group 3: Written to Oral.* A written version of the recorded saying presented to Groups 1 and 2 was distributed to the subjects. They were asked to read the saying three times. The written versions were then collected, and the subjects were asked to immediately proceed into a private room and "repeat as accurately as possible the saying you just read" into a tape recorder.
- *Group 4: Written to Written.* A written version of the recorded saying presented to Groups 1 and 2 was distributed to the subjects. They were asked to read the saying three times. The written versions were then collected, and the subjects were asked to immediately "write down as accurately as possible the saying you just read."

Once the subjects finished their initial tasks, they were asked to complete the same task with a parable and a miracle story. The reproductions generated from these tasks represent short-term memory (STM) recall. The text for the saying, the parable, and the miracle story were derived from unfamiliar extracanonical sources and were modified so that responses from previous memory would be impossible. The subjects were presented with novel material, yet within the genre of traditional words of Jesus and stories about him found in ancient sources.

- *The Test Saying* (cf. *Gospel of Thomas* 75): "Many people are standing at the door, but those who are virgins are the people who will enter the bridal chamber."
- *The Test Parable* (cf. *Gospel of Thomas* 97): "The kingdom is like a woman carrying a jar filled with meal. While she was walking on the road still a long way from home, the handle of the jar broke. Behind her, the meal leaked out onto the road. She did not realize it. She had not noticed a problem. When she arrived at her house, she put the jar down and found it empty."
- *The Test Miracle Story* (*Infancy Gospel of Thomas* 10.1–2): A young man was chopping wood and the axe fell and split open the sole of his foot. He bled so much that he was about to die. When Jesus heard the crowd calling out for help, he ran over to the man, forcing his way through the crowd. He took hold of the injured foot, and it was healed immediately. And he said to the young man, "Arise now, cleave the wood and remember me."

Because I wished to know how the transmission of this type of material is handled in real-life memory beyond STM recall, I did not tell the subjects that they would have to do anything further. But one week later,

to test long-term memory (LTM) recall, I called upon the subjects to take up their pencils or their tape recorders once again and reproduce "as accurately as possible the saying that they had heard or read." Similarly, *R*s were requested for the parable and the miracle story.

For the second experiment, twenty-seven subjects were given a handout that read:

> Read the selected sayings and stories of Jesus. Compose in your own words a short narrative about Jesus with reference to the text you have read. You will retain the text during composition. You can also use your own remembrances of Jesus' words and actions in order to present what you want to say about Jesus. You are limited to no more than two pages.
>
> - "Many people are standing at the door, but those who are virgins are the people who will enter the bridal chamber."
> - "The kingdom is like a woman carrying a jar filled with meal. While she was walking on the road still a long way from home, the handle of the jar broke. Behind her, the meal leaked out onto the road. She did not realize it. She had not noticed a problem. When she arrived at her house, she put the jar down and found it empty."
> - A young man was chopping wood and the axe fell and split open the sole of his foot. He bled so much that he was about to die. When Jesus heard the crowd calling out for help, he ran over to the man, forcing his way through the crowd. He took hold of the injured foot, and it was healed immediately. And he said to the young man, "Arise now, cleave the wood and remember me."

Students were told to complete the task within twenty minutes. Their written *R*s were then collected.

My two pilot experiments have generated data that warrants further investigation. Although my subject sample is too small to be statistically meaningful, the data supports the outcomes of other experimenters as well as theoretical studies of folklore, orality, scribality, and rhetoric. Here again, I will first describe observable patterns of stability in memory and then notable patterns of instability.

Results and Analysis: Patterns of Stability

Notable patterns of stability were evident in sequenced verbal agreement, the openings and closings of the *R*s, and the repetition of major images and themes. Each of these patterns will be discussed briefly below, along with the relevant tabulated data.

On the topic of *sequenced verbal agreement,* the number of words reproduced in exact sequence appears to be significantly different between media modes that were entirely dependent upon memory and those where written sources were retained. This trend is indicated in Tables 1–4 below. For these tables, averages were calculated since there was no significant difference between the average and the mean.

As Table 5 below indicates, when written sources were retained, the longest string of verbatim words in sequence is significantly higher than any of the reproductions relying on memory (cp. Tables 1–4). The degree of difference was substantially higher when the statistics for WSR *R*s are compared to LTM *R*s within any of the memory-dependent environments. For WSR *R*s of the Virgin Proverb, on average the longest string of exactly sequenced words reproduced was 18–19 (86% of the proverb). For WSR *R*s of the Jar Parable, on average 22–23 words (33% of parable) were preserved. For WSR *R*s of the Foot Miracle story, on average 9–10 words (12% of story) were copied verbatim.

The LTM *R*s of the presented material did not produce long verbatim strings: Virgin Proverb (maximum 8, 1 *R*; average 3 words); Jar Parable (maximum 11, 1 *R*; average 6 words); Foot Miracle (maximum 15, 1 *R*; average 7 words). When the written source was retained, the *R*s had very different numbers. The longest verbatim strings reached 20–21 for the Virgin Proverb in 13 *R*s; 3 *R*s of the Jar Parable reproduced 26, 44, and 76 words in order; 2 *R*s of the Foot Miracle story managed 20 and 26. The only other occasions where verbatim sequences surpassed 15 words were in immediate STM reproductions. The only time that exact reproduction of the presented material occurred was in STM *R*s of the Virgin Proverb and WSR *R*s of the Virgin Proverb and the Jar Parable (see Tables 1–4).

These results do not come as a surprise. In fact, they reflect what psychologists have concluded about the phonological or articulatory loop, one of the components of human memory (see Baddeley 1995). In the short term, presented words can be stored in this articulatory loop in verbatim form. But the loop has a limited capacity. This means that the words in the loop are quickly replaced by subsequent words, and verbatim recall of the presented material decays substantially with as little as twenty intervening syllables (Sachs 1974, 99). Thus, even when there is a desire to do so, it is extremely difficult to recall lengthy exact sequences of words without access to written texts (see Hunter 1985; Goody 1998).

Since it is highly unlikely that the Jesus traditions were transmitted via immediate STM recall, I conclude from this experiment that exact reproduction of sequences of sixteen or more words in length is suggestive of copying from a written source, confirming what McIver and Carroll found in an earlier study.[5] It also appears from the results of this pilot experiment

TABLE 1

VERBAL AGREEMENT PER REPRODUCTION OF VIRGIN PROVERB

Media environment	Average longest string of verbatim words in exact sequence (out of 21 words)	Average longest string of verbatim words in exact sequence (% of proverb)	% of reproductions with exact strings of words above 17	% of reproductions that were exact reproductions of the proverb	% of subjects who did not attempt to reproduce the proverb
OO: STM Memory	14.75	70	25	25	0
OO: LTM Memory	2.14	10	0	0	13
OW: STM Memory	13	62	11	11	0
OW: LTM Memory	3	14	0	0	44
WO: STM Memory	12.28	58	21	21	0
WO: LTM Memory	3.62	17	0	0	50
WW: STM Memory	17.38	83	46	40	13
WW: LTM Memory	3.66	17	0	0	47

TABLE 2

VERBAL AGREEMENT PER REPRODUCTION OF JAR PARABLE

Media environment	Average longest string of verbatim words in exact sequence (out of 66 words)	Average longest string of verbatim words in exact sequence (% of parable)	% of reproductions with exact strings of words above 17	% of reproductions that were exact reproductions of the parable	% of subjects who did not attempt to reproduce the parable
OO: STM Memory	13.56	21	22	0	11
OO: LTM Memory	7.67	12	0	0	11
OW: STM Memory	10.57	16	33	0	0
OW: LTM Memory	4.63	7	0	0	38
WO: STM Memory	14.11	21	7	0	0
WO: LTM Memory	4.4	7	0	0	46
WW: STM Memory	15.57	24	28	0	46
WW: LTM Memory	6.75	10	0	0	38

TABLE 3

VERBAL AGREEMENT PER REPRODUCTION OF FOOT MIRACLE STORY

Media environment	Average longest string of verbatim words in exact sequence (out of 76 words)	Average longest string of verbatim words in exact sequence (% of story)	% of reproductions with exact strings of words above 17	% of reproductions that were exact reproductions of the story	% of subjects who did not attempt to reproduce the story
OO: STM Memory	18.11	24	33	0	10
OO: LTM Memory	5.22	7	0	0	10
OW: STM Memory	12.22	16	22	0	0
OW: LTM Memory	6.50	9	0	0	56
WO: STM Memory	16.07	21	36	0	0
WO: LTM Memory	7.13	9	0	0	36
WW: STM Memory	18.08	24	31	0	7
WW: LTM Memory	7.13	9	0	0	43

TABLE 4

VERBAL AGREEMENT WHEN WRITTEN SOURCES RETAINED

Presented material	Average longest string of verbatim words in exact sequence (when not paraphrased)	Average longest string of verbatim words in exact sequence (% of story when not paraphrased)	% of reproductions with exact strings of words above 17 (when not paraphrased)	Exact reproduction of presented material (when not paraphrased)	Paraphrase reproduction of presented material	% of subjects who did not attempt to reproduce the material
Virgin Proverb (out of 21 words)	18.93	90	81	80	38	11
Jar Parable (out of 66 words)	22.89	35	33	11	63	11
Foot Miracle Story (out of 76 words)	9.75	13	25	0	67	11

TABLE 5
AVERAGE NUMBER OF WORDS OCCURRING IN EXACT SEQUENCE IN LTM *Rs* AND WSR *Rs*

	OO: LTM	OW: LTM	WO: LTM	WW: LTM	WSR
Virgin Proverb	2–3 words (10%)	3 words (14%)	3–4 words (17%)	3–4 words (17%)	18–19 (86%)
Jar Parable	7–8 words (12%)	4–5 words (7%)	4–5 words (7%)	6–7 words (10%)	22–23 (33%)
Foot Miracle Story	5–6 words (7%)	6–7 words (9%)	7–8 words (9%)	7–8 words (9%)	9–10 (12%)

that there is an enormous difference in the accuracy of reproductions of the three genres presented. This conclusion also complies with McIver and Carroll's earlier experimental findings and with Rubin's interdisciplinary treatment of various genres found in oral tradition. Rubin found that certain genres have multiple constraints, making (near) verbatim recall easier. These constraints are imagery, rhythm, and rhyme (Rubin 1995, 300). In line with this observation, Walter Ong has noted that the one genre that *can* reproduce verbatim words at length is song lyrics. Based on the fieldwork of other scholars, Ong notes that poetry in oral cultures has a 60 percent accuracy rate when it comes to verbatim reproduction (1982, 61–63).

Analysis of my own experimental data suggests that the proverb was more accurately transmitted in all media environments, including WSR, although it was *only reproduced exactly* in STM *Rs* (24%) and WSR *Rs* (80%; Tables 1 and 4). This may be because of the proverb's shorter length, pithier imagery, and parallel structure. The parable held the middle ground with 11 percent verbatim reproduction when the written source was retained. It was never duplicated exactly in any of the memory-dependent environments (Table 2). The miracle story (which was only ten words longer than the parable) appears to be the most pliable and least accurately transmitted of the three genres studied. No subject reproduced it exactly in any of the media environments, including WSR (Tables 3 and 4). It is worth noting that any advantage that the WSR mode had in terms of verbatim reproduction of the proverb and the parable collapsed in reproductions of the miracle story. In LTM *Rs*, the longest string of words reproduced verbatim was between 5 and 7; for WSR *Rs*, 9–10.

The *openings and closings* (the first 8–9 words and the last 3–4 words in the test texts) were the most stable elements in the sample reproductions. This was the case across the board in all media environments, although in the WSR *Rs* it was often the case that the presented material was framed out with substantial editorial, sometimes moralizing, material immediately preceding or following the saying or story. This was usually attached to the stable opening or closing of the presented saying or story.

Examples of WSR editorial openings:

- "*While Jesus was walking,* a young man . . ."
- "*One such was* a young man . . ."
- "*Also Jesus would tell stories or parables such as that of* the woman . . ."
- "*Turn down in your mind all other images and prepare to know him; he calls us to void ourselves of every evil and sin, for it is said,* many people are standing . . ."

- "*Jesus was walking with his disciples on the way to Capernaum. As he passed a certain town, a few villagers approached him and begged that he come to where a young man lay dying.* He had been chopping wood . . ."
- "*Now Jesus' disciples sat about him and asked him questions such as 'What is the kingdom like and which of us will enter?' And Jesus said to them,* "Many people are standing . . ."
- "*Some people in the crowd accused Jesus of using demonic powers to heal the man. Jesus said, 'Can a Kingdom divided against itself stand?* Many people are standing . . ."

Examples of WSR editorial closings:

- ". . . will enter the Bridal Chamber. *Virginity is a sign of purity, and the bridal chamber represents the kingdom of heaven. Jesus is teaching us that we must be pure in soul in order to become one with God.*"
- ". . . 'remember me.' *He wanted people to know how having faith can save a person.*"
- ". . . 'remember me.' *Keeping one's mind focused on higher things is of utmost importance.*"

This type of editorial adjustment was not noted with the memory-dependent modes since the subjects' task was recall, not recontextualization. There was a tendency, however, in the memory-dependent modes to reproduce typical formulaic introductions to folklore narratives. Quite frequently, subjects began the saying or story with "there are/was/were," "one day," "one time," or "there once was." This occurred more consistently in introductions to the miracle story than in either of the other genres. On three occasions, a short pithy interpretation was tacked onto the ending: "This is what the kingdom of heaven is like"; "she was confused"; "she is confused."

The final notable pattern of stability in my test samples relates to major *images and themes*. Within each genre, there were several words that were very stable and consistently remembered in both STM *R*s and LTM *R*s. Since LTM *R*s were more distorted, they show the minimal images recalled. As for the proverb, the words that were retained consistently were "virgin(s)," "enter," and "brid(al) chamber." In *R*s of the parable, the words that were reproduced consistently were "the kingdom is like a woman," "jar," "meal," "walking," "the jar broke," and "empty." For *R*s of the miracle story, the stable words included "man chopping wood," "axe," "his foot," "crowd," "foot," "healed," "said," and "remember me." It appears that these images represent the core of the presented material. The rest of the saying or story was then reconstructed from memory to connect these fragmented images into a coherent whole with a meaning quite close to the original material. The gist was what mattered, not the exact words or details.

This finding is consistent with research on how remembered "texts" are performed orally as well as how human recall functions. A theory called "fuzzy trace" has developed from studies on verbatim memory and gist memory. It has been found that as children mature beyond middle childhood, there is a shift to dependency on gist memory from verbatim. This means that, for the adult, what makes it into long-term memory is not exact verbiage but the meaning or gist of the presented material (Miller 1998). The basic premise of the material is remembered, along with vivid themes or images. So the premise helps the subject recreate the "text" by reconnecting the themes or images into a rational whole. This results in reproductions that have shifts in details but stability in meaning and short phrases.

The WSR *R*s did not have this same pattern. What was reproduced was fairly accurate, especially within the proverbial material (Virgin Proverb and Cleave the Wood saying). This is not to say that substantial material was not deleted or moved into paraphrase in WSR *R*s. But the subject of WSR reproductions appeared to be selective in what was remembered very accurately and in what was modified. The results of these experiments suggest that the WSR subjects were more likely to be conservative in their reproductions of the words of Jesus than they were in their reproductions of stories about him. Although they did take minor liberties, adjusting parts of the proverb and parable to fit their larger narrative, these adjustments were far less severe than the ones made to the miracle story, which was pared *substantially.* Thus, the Cleave the Wood saying at the end of the miracle story (Table 6 below) was reproduced far more accurately than any of the other aspects of the miracle story in the WSR *R*s: 63 percent copied exactly the words "cleave the wood," while taking much greater liberties with the other portions of the story. Contrast this with the fact that none of LTM *R*s were able to reproduce the Cleave the Wood saying exactly (or the Virgin Proverb).

This data suggests that the subjects who retained the written source were less willing to alter Jesus' words than to change drastically narrative material about him. Thus, if we have two copies of a narrative that contains words of Jesus, and in those two copies the words of Jesus are exact duplicates while the narrative is similar but not verbatim, it is highly probable that a copyist has reflected on a written source.

TABLE 6

VERBAL AGREEMENT PER REPRODUCTION OF CLEAVE THE WOOD SAYING

Media Environment	Exact Reproduction	Sample Alternate Reproductions of Cleave the Wood Saying
OO: STM	78%	Arise now and remember. Rise and cleave your wood.
OO: LTM	0%	Cleave to the wood and be healed. Remember me and continue to chop the wood. Go forth and remember me. Arise. Go cleave your wood and remember me.
OW: STM	22%	Rise now. Cleave the wood and remember me. Go now. Cleave wood and remember me. Cleave the wood and remember me. Get up. Cleave the wood and remember me Now go. Cleave wood and remember me.
OW: LTM	0%	Be healed and remember me. Get up and walk. Believe in me. Arise. Cleave the wood and remember me.
WO: STM	14%	Cleave the wood and remember me. Now go, cleave the wood and remember me. Arise. Cleave the wood and remember me. Continue to cleave the wood and remember me. Arise now. Cleave the wood and you are healed. Continue cleaving wood and remember me. Go now. Cleave the wood and remember me. Arise. Cleave to the wood and remember me. Arise. Cleave your wood and remember me. Arise now and cleave the wood and remember me.
WO: LTM	0%	Continue to cleave the wood and remember me. Believe in me. Go forth and remember me. Rise. Go cleave the wood and remember me. Rise and follow me and go.
WW: STM	15%	Be healed and remember me. Get up and walk. Believe in me. Arise. Cleave the wood and remember me. Arise now. Cleave wood and remember me. Arise and cleave this wood and remember me. Cleave wood and remember me. Arise. Cleave wood and remember me. Arise now and cleave the wood and remember me. Arise. Arise now. Cleave the wood and follow me.
WW: LTM	0%	Rise and cleave the wood and remember me. Arise. Chop wood and remember me. Get up. Go on and remember me always. Go and remember me. Go. Cleave wood and remember me. Go and cleave this wood and remember me.
WSR	63%	Go finish your work. Jesus told the man to continue his love and remember Jesus. Arise now and remember me. Arise now. Cleave wood and remember me.

Furthermore, because I doubt that the transmission of Jesus' sayings relied on STM reproductions, and because none of the LTM *Rs* in my experiment were able to reproduce either proverb verbatim while the WSR *Rs* readily and consistently did so, when two sources offer identical reproductions of a saying of Jesus, copying is most likely involved in that transmission (compare McIver and Carroll 2004, 1263–64).[6] This does not mean that it is impossible for a proverb to have been transmitted verbatim within an oral environment, especially if it were very short. Kenneth Bailey, in fact, points out a publication by Isa Atallah of Middle Eastern proverbs whose contemporary use is "in a totally fixed form" (Bailey 1995, 365). But this type of fixed form requires a lengthy intergenerational traditioning process that had not yet occurred when the early Christian sources were first scribed. This suggests that verbatim oral transmission of sayings of Jesus would have required from the orator a determined effort to memorize the sayings and a 100 percent accuracy rate in that recall. Since verbatim reproduction does not appear to have been the goal of even trained ancient rhetoricians, I find it much more plausible to concede literary dependence even for Jesus' proverbs when we see verbatim reproductions in our sources and when the material is not liturgical or conventional. More experimentation will be needed to confirm or repudiate this finding.

Results and Analysis: Patterns of Instability

The presented material was modified by my subjects in several consistent ways. All STM *Rs* showed that the majority of the presented material could be recalled very accurately, while LTM *Rs* demonstrated a great loss or decay in the retention of the material after only a week's interference. This seemed to work on a sliding scale, with the least loss in reproductions of the proverb and the most loss in reproductions of the miracle story. The same was true for the WSR *Rs although to a much lesser extent:* the

distortion of the material was minimal in the proverb *R*s and greatest in the miracle story *R*s. Notable patterns of instability included deletions, additions, substitution of synonyms, and paraphrases.

The most substantial modification to the presented material was in terms of *deleted words* (see Tables 7–9 below). The number of deletions appeared to be dependent upon the genre, with the proverb least affected and the miracle story most affected. In all memory modes, words unimportant or unnecessary to the meaning of the presented material were deleted. Particularly vulnerable were prepositional phrases and relative clauses. Details extraneous to the meaning, disliked by the subject, or unfamiliar to the subject vanished.

The deletions in the reproductions of the proverb (Table 7), although relatively high in the LTM modes (9–10 words per *R*), were stable and persistent across many of the *R*s in all memory modes (Table 10 below). The subjects did not recall words extraneous to the meaning of the proverb. Particularly vulnerable were the relative clause constructions: "those who are"; "are the people who will." The proverb was severely and consistently condensed in terms of words but not of meaning. Frequently in LTM *R*s, the first clause of the proverb was eliminated so that the saying condensed to its last clause: "Only those who are virgins will enter the bridal chamber"; "Only a virgin will enter the kingdom ofheaven"; "Only virgins may enter the door"; "The virgins are many but the bridegrooms are few." These cases show the connection of the presented material with already existing schema familiar to the subjects. In the last example above, the proverb has been fitted into the memory of a well-known Jesus saying about the few who find the gate (cf. Matt 7:14) or enter through the door (cf. Luke 13:23-25). Comparatively, the number of words deleted was insignificant in STM *R*s (1–2) and WSR *R*s (>1).

In the Jar Parable, the words that were not reproduced from the presented parable were quite consistent in the LTM *R*s (Table 11). This amounted to a shortening of the parable by half the words in LTM *R*s (average 30–31 words per *R*; Table 8). The beginning and ending of the parable were relatively stable when compared to the middle, where most of the deletions occurred. The cases in which a high number of *R*s deleted exactly the same words are "woman," "filled with meal," "on the road," "still a long way," "while," "behind her," "carrying," "onto the road," "(she) had not noticed a problem," and "at her house." These are all details that are not necessary to the central meaning of the parable. The result is LTM *R*s condensed and focused on only the central pithy features, its thematic bones. As one *R* has it, "The kingdom of heaven is like a woman with a jar of meal. At the beginning of her walk the jar was full, but there was a hole in it that she did not notice. When she arrived, she went to get the meal only to notice the jar was empty." The deletions were half as many in STM *R*s (14–15) and WSR *R*s (17–18; Table 8).

The most pliable of the genres was the miracle story, although stability is observed even in LTM *R*s in the opening of the story ("a young man was chopping wood and the axe fell") and in the end, which contained the Cleaving saying (Table 12 below). In STM *R*s, the entire saying was faithfully recounted, "Arise now! Cleave the wood and remember me," but in LTM *R*s it often was shortened to some variation of "Arise and remember me." Deletions were massive. In STM *R*s, an average of 13–14 words per *R* were not recalled; in LTM *R*s, this doubled to 37–38 words lost per reproduction on average. In WSR *R*s, deleted words averaged 32–33 per *R* (Table 9). The lost details occurred mostly in the middle of the story: the man split open "the sole" of his foot; he bled "so much that he was about to die"; "Jesus heard the crowd calling out for help"; "forcing his way" through the crowd; he "took hold of the injured" foot; Jesus said "to the young man"; "cleave the wood." The result is versions of the story stripped of details, condensed to the bones, as noted in this LTM *R*: "A man was chopping wood. The axe slipped and cut his ankle. The crowd began to shout and Jesus heard and came over. He grabbed the man's foot and immediately healed it. The man looked up and Jesus said to him, 'Remember me, and continue to chop the wood.'"

A second notable pattern of instability in the *R*s related to *additions* of material. Contrast the deletions with the number of words added, and it quickly becomes clear that even moderate expansion of the presented material is not the norm in any of the memory environments. This is particularly the case for reproductions of the proverb, with more flexibility demonstrated for parable and miracle story reproductions. In the LTM *R*s of the proverb, additional words per *R* averaged between 2 and 3 (Table 7). Very little was added in STM *R*s (>1 word). What was added most consistently in these LTM *R*s was the concept that "only" the virgins will enter. A few LTM *R*s began the proverb with a more traditional opening: "There are. . . ." Also added was the notion that the virgins were "allowed" to enter. The WSR *R*s showed on average that less than 1 word was added per reproduction. What this means, practically, is that 5 *R*s added 1–2 words to the proverb: "(waiting) outside"; "only (virgins)"; "(but) only"; "the (virgins)"; "only (ones)"; "allowed to (enter)."

The unique additions in the LTM *R*s appear to result from the tendency of human memory to connect new material to similar material or

TABLE 7

AVERAGE NO. OF WORDS DISTORTED PER REPRODUCTION OF VIRGIN PROVERB

Media Environment	Number Change	Tense Change	Synonym Substitute	Words Added	Words Deleted	Pronoun Change	Trans-position
OO: STM Memory	.13	0	.33	1.0	2.71	.33	0
OO: LTM Memory	.44	.33	1.22	2.78	9.33	.11	0
OW: STM Memory	0	.13	.22	.13	2.56	.22	0
OW: LTM Memory	0	.60	1.2	1.2	11.40	.20	.20
WO: STM Memory	0	.07	0	.21	.79	.14	.21
WO: LTM Memory	.25	.50	.29	1.14	9.71	0	0
WW: STM Memory	0	.07	.15	.15	1.23	.15	0
WW: LTM Memory	.44	.33	.50	5.75	8.75	.11	.11
WSR	0	.07	.26	.27	1.07	.07	0

TABLE 8

AVERAGE NO. OF WORDS DISTORTED PER REPRODUCTION OF JAR PARABLE

Media Environment	Number Change	Tense Change	Synonym Substitute	Words Added	Words Deleted	Pronoun Change	Trans-position
OO: STM Memory	0	1.33	4.44	6.11	8.22	.33	.56
OO: LTM Memory	0	2.33	4.56	11.11	30.66	.89	.78
OW: STM Memory	0	1.11	5.67	3.66	16.22	.56	1.4
OW: LTM Memory	0	1.8	3.8	13.00	33.00	.40	1.0
WO: STM Memory	0	1.14	3.93	3.00	20.86	.14	0
WO: LTM Memory	0	1.88	6.86	8.29	29.57	0	.25
WW: STM Memory	0	1.33	5.14	3.57	11.71	.22	.66
WW: LTM Memory	0	.71	7.25	6.25	28.88	.57	1.00
WSR	0	.67	3.33	7.22	17.44	.33	.11

TABLE 9
AVERAGE NO. OF WORDS DISTORTED PER REPRODUCTION OF MIRACLE STORY

Media Environment	Number Change	Tense Change	Synonym Substitute	Words Added	Words Deleted	Pronoun Change	Trans-position
OO: STM Memory	.33	.89	4.66	2.89	14.89	1.44	.44
OO: LTM Memory	0	1.22	4.38	15.63	40.38	.88	1.25
OW: STM Memory	.22	1.22	6.25	4.88	16.89	1.11	.56
OW: LTM Memory	0	.75	5.5	11.75	39.25	1.25	1.25
WO: STM Memory	.29	.86	5.21	5.29	13.36	2.21	.57
WO: LTM Memory	0	1.25	8.00	7.63	37.50	1.38	.50
WW: STM Memory	.15	.85	4.46	2.31	10.69	2.61	.46
WW: LTM Memory	0	1.38	6.00	9.38	31.75	2.13	1.25
WSR	0	1.4	3	17.8	32.5	0	.9

to confuse related items (Table 13). For instance, one *R* added "Truly I tell you" at the beginning of the saying, thus bringing the saying in line with other sayings of Jesus familiar to the subject. Another subject put the saying into the context of the parable of The Maidens and the Lamps (Matt 25:1-13), a connection that appears to have been triggered by shared bridal imagery (although that imagery was not reproduced by the subject!): "The kingdom of heaven is like a virgin with a jar of oil." Another subject confused the saying with the parable of The Wedding Banquet (Matt 22:1-10): "The kingdom ofheaven is like a wedding banquet." Two other subjects remembered two keywords: "virgin" and "door." One of these subjects remembered the words but not their exact relationship and so recalled, "A virgin is like a door." The other subject appears to have had the same difficulty and reproduced, "A virgin on a doorstep." This tendency of memory was not found in any of the WSR *R*s, where unique additions were not noted, nor in STM *R*s.

The number of words added to LTM *R*s of the Jar Parable was substantially higher than in the LTM *R*s of the Virgin Proverb: 9–10 (Table 9). Quite consistent was the addition of the phrase "of Heaven" or "of God" to "kingdom" in LTM *R*s, while no such addition occurred in the STM *R*s. Preexisting schema appear to have impacted these cases. The other common addition was verbal adjustment: "start to" or "begin to" was added to "leak onto the road." STM *R*s added 3–4 words on average. These were relatively minor distortions: "one day"; "there was"; "(broke) off"; "all the way." WSR *R*s held the middle ground with 7–8 new words added per *R*. These additions were more substantive than those found in the STM *R*s: "coming home with the jar"; "broke unbeknown to her"; "leaking out of a hole in the container, it trickled out little by little."

Most unique additions (Table 14) were embellishments of preexisting elements of the story like "the woman filled the jar and placed it on her back, not noticing that the jar was broken," or "the jar was full but there was a hole in it." There was also a tendency to rationalize or explain the parable. Two STM *R*s added a note at the end that "she was confused," while a LTM *R* added, "she figured out something was wrong." The tendency to explain the parable was most prominent in the unique LTM addition, "She did not realize it was empty until she was at her house. *This is what the kingdom of heaven is like.*" These interpretive additions are very simple when compared with the constant push to reflect and moralize in the WSR *R*s. As noted earlier, the WSR subjects tended to append significant interpretive matter to the closings of the presented material.

TABLE 10

PERCENTAGE OF SAME ALTERATIONS IN REPRODUCTIONS OF VIRGIN PROVERB

Alteration	OO: STM	OO: LTM	OW: STM	OW: LTM	WO: STM	WO: LTM	WW: STM	WW: LTM	WSR	Total %
+ There are				40	29					8
– many people are	13			40	7	75		38		19
– people	13	57		60	14	83		63		32
– many people are standing at the door		63		40		40		38		20
stand < wait/knock/come	38	25		40		17	7		6	15
– standing		57		40	50	67		50		29
– the door		57		60		50		38	6	23
door < gate		25						13		4
– those who are		71		60	7	67	7	75	12	33
+ only		43	11	40	21	50	7	88	20	31
those < people/ones		13		20				13		6
– the people who will			55	80	36	100	29	100	12	46
people < ones/those	38		22		14		14		6	10
+ allow (to enter)								25	6	3
– bridal chamber	13	37		40		33			6	14
bridal chamber < Kingdom of Heaven/door/ Bed Chamber/Bridal Suite/Bridal Party/Bride Chambers/Bride Groom Chamber		37		20		17		38		12

TABLE 11

PERCENTAGE OF SAME ALTERATIONS IN REPRODUCTIONS OF JAR PARABLE

Alteration	OO: STM	OO: LTM	OW: STM	OW: LTM	WO: STM	WO: LTM	WW: STM	WW: LTM	WSR	Total %
– The Kingdom is like		33		20	7	20		40	11	15
Kingdom < Kingdom of Heaven		44		80	14	80	14	60	11	34
– woman		44		20	14	20				11
– carrying		67		20	21	20		80	11	24
– filled			57	60	36	30		60	33	31
filled with < full of			22	20	36	20	57	40	22	24
– filled with (meal)		100		20	7	20		40	33	24
meal < mead/water/grain/sand/seed/wine				40	14	40		20	22	15
while < as/when	11		33		21			20		9
– while		78		100	43	100	14	60	33	48
she < woman	22		22		7	20	14	20	11	9
– she	11	44	22	80	28	80	43	40	33	42
– walking	22	22	22	60	57	60	29	60	22	39
on < down/along	11	33	11		14		29	80	11	21
– on the road	44	44	44	100	43	100	29	100	78	65
– still a long way (from home)	22	100	33	80	50	80		20	67	50
long way < far (away)	11		11				14	40	11	10
– handle	22	33	22	60	14	60		40	22	30
– of the jar	78	44	22	80	43	100	14	60	22	51
– behind her	89	78	11	30	86	40	57	80	67	60
behind her (transposed)	22	33	56	40	14	60	43	20	11	33
– leak		22	11	40	29	20		40	11	19
leak < spill/pour/fall		56	33	60	29	40	43	60	33	39
+ start/begin to	67	11	22		14	20	29		11	19
– onto the road	67	66	66	80	79	80	29	80	44	66
– she did not realize it	22	33	11	20	29	40	14	20	44	26
realize < notice/know	11	11	44	60	29	60	43	60		35
– it	44	44	33	20	64	100	57	20	56	49
– (she) had not noticed a problem	33	67	44	60	43	80	14	60	67	36
notice < realize/know/see	22	22	11	40		7	29	20		17
a problem < there is a problem		11	22	20	29		43		22	16
arrive < get		67	87	40	86	60	86	40		52
arrive < reach/return			11	20	7	20		20		9
– at her house	89			80	100	100	100	80	11	62
at her house < home	89	56	100	80	100	100	100	80	57	85
– the jar down		33	22		38	60				17
down (transposed)	33			20	21	40	14	20		16
– put down	56	44	22	80	29	60	28	80	57	51
put < set/place	11	11	22		36					9
– found	11	44	22	60	43	60	14	60	22	37
find < notice/realize/discover	64	22	33	20	21	20	14	20	11	25
empty < almost gone/gone	33		11			20				7
empty < is/was empty	33	67	33	80	71	60	57	80	22	56
+ she is confused							14	20		4

As for the miracle story (Table 9), additions to STM *R*s were relatively minor (average 3–4 per *R*). The added words shifted the verbiage slightly: "was (bleeding)"; "began to (shout)." But in LTM *R*s, this average tripled (11–12 per *R*) and resulted in many more unique and elaborate additions (Table 15 below). LTM additions included new "starts" for the story: "Jesus was teaching and a man . . ."; "While Jesus was preaching, a man with a broken foot . . ."; "One day a man . . ."; "Using an axe while trying to chop the wood . . ."; "One day while . . ."; "One time, Jesus was walking. . .". Story embellishments were observed: "a man cleaved his foot using an axe while trying to chop wood"; "the axe fell and hit his foot and broke it open and there was a crowd around"; "and he heard a man scream"; "cutting down a tree." End additions served to interpret the miracle story, to explain it more fully: "Jesus says, 'Your faith has saved you'"; "and this displayed his power."

In WSR *R*s, 17–18 words on average were added to each reproduction of the miracle story (Table 9). This suggests that the miracle story is the most pliable genre studied even when the written source was retained. Elaboration of some details was observed: "nearby accidentally"; "a man lay dying"; "who had cut his foot badly"; "was losing so much blood"; "the people begged Jesus to heal the man"; "without hesitation"; "the foot was healed the instant Jesus touched it." As noted earlier, additions to the openings and closings of the miracle story were also noted, lengthy and reflective appendices that serve to contextualize and moralize the story.

The presented material, especially in the memory-media environments, underwent a vast shift in verbiage, particularly the *substitution of synonyms*. Words were not simply deleted and added but rather were shifted to completely different synonymous terms. Sometimes the new word was more suitable for modern conversation or represented a particular shift for schematic reasons.

The proverb experienced the lowest number of synonym shifts: practically 0 in STM *R*s (average >1); 1–2 in LTM *R*s; >1 in WSR *R*s (Table 7). The types of STM substitutions were common words: "waiting" < "standing"; "those" < "people." In WSR *R*s, one subject shifted "standing" < "waiting" and another subject shifted "people" < "only ones." In the LTM *R*s, the subjects appear to have adjusted the proverb more heavily, fitting it into preexisting schema: instead of standing at the door, the people "knock," a word choice likely connected to a familiar Jesus saying about knocking (cf. Matt 7:7-8; Luke 11:9-10; Luke 13:25; *Gos. Thom.* 94). The "door" became the "gate," a shift that may have been influenced by prior knowledge of Matthew 7:13-14. Since the bridal chamber is not a very familiar image

TABLE 12
PERCENTAGE OF SAME ALTERATIONS IN REPRODUCTIONS OF MIRACLE STORY

Alteration	OO: STM	OO: LTM	OW: STM	OW: LTM	WO: STM	WO: LTM	WW: STM	WW: LTM	WSR	Total %
– young	11	75	11	75	47	88		63	26	44
man < boy		25				13				4
– was chopping wood		25		25	7	26		13	38	15
and < when/as/but	22	13	33	25	47	50	38	26	26	31
– and	56	38	44	75	7	38	8	50	63	42
– fell	11	13	11	50	21	13		26	63	23
fall < slip/drop		25	11			26		26	13	11
split < cut/cleave/injure/slice/land	11	88	56	50	21	38	23	38	63	43
– split		13		25	29	26	8	26	13	16
– open	56	88	56	100	79	75	31	100	75	73
– the sole of (his)		75		50	14	63		38	38	31
so much < profusely/heavily/a lot/bad/bled and bled/losing so much blood	11	13	11		29	38		13	26	16
– he bled so much	22	63	11	50	7	50		50	38	32
– that he was about to die	22	63	11	50	7	38		63	38	32

TABLE 12 *(cont.)*

PERCENTAGE OF SAME ALTERATIONS IN REPRODUCTIONS OF MIRACLE STORY

Alteration	OO: STM	OO: LTM	OW: STM	OW: LTM	WO: STM	WO: LTM	WW: STM	WW: LTM	Retain Sources	Total %
about to die < almost died/to point of death/near death/nearly died/to death/could have died/would soon die	33	25	33	25	14	38	31	13	26	26
– when Jesus heard	11	88		50		63	16	50	75	39
– when	22	88	44	100	7	63	31	50	75	53
– heard	11			50		63	8	50	75	29
– crowd	11	38		50	14	13		50	63	27
crowd < people/townspeople	11	13	11	25		50				12
crowd < man/him			11		7		8	26		4
call out < cry/shout/yell/cheer	22	25	44	25	21	63	38	50	13	33
– calling out for help	22	75	44	75	36	63	23	63	50	46
– for help	44	75	56	100	43	50	23	63	50	56
– run		38	44	25	21	38	16	50	38	30
run < make his way/rush/go/come	33	25	33	50	43	38	16			26
– over	67	87	44	75	71	50	62	100	100	73
– to the man	44	87	67	50	50	50	31	88	38	56
– forcing his way	33	38	22	50	21	88		38	38	36
force < push/work/make	11	50	11	50	21	13	46	38	26	30
– through the crowd		50	22	50	21	75	8		38	29
take hold of < hold/grab/touch/clasp/lift/ place/heal	33	63	57	50	50	38		38	50	42
– (took) hold of		38	57	25	50	63	69	88	88	53
– injured	56	100	78	100	86	100	77	100	88	87
– to the young man	22	63	44	75	14	88	23	38	38	45
– young	78	63	100	100	64	100	85	75	75	82
– arise	11	75	22	25	29	50	8	26	26	30
arise < rise/go/get up and walk/continue	11		33	50	21	50	16	63	13	29
– now	22	100	33	100	57	100	54	100	38	67
– cleave the wood	11	75		75		75	8	50	50	38
– and remember me	11	38		25	7	38	8	26	13	18
remember me < believe in me/follow me/you are healed				25	7	26	8		13	9

TABLE 13
UNIQUE ADDITIONS TO VIRGIN PROVERB

Media Environment	Additions
OO: STM	None
OO: LTM	Truly I tell you The virgins are many, the bridegrooms are few Only a virgin will enter the Kingdom of Heaven
OW: STM	None
OW: LTM	A virgin on a doorstep A virgin is like a door
WO: STM	None
WO: LTM	The door to heaven
WW: STM	None
WW: LTM	The Kingdom of Heaven is like a virgin with a jar of oil Purity is like faith The Kingdom of Heaven is like a wedding banquet
WSR	None

in the traditional words of Jesus, "bridal chamber" became "kingdom of heaven." Because the subject was unfamiliar with this image, the reproduction often shifted to compatible bridal images: "bed chamber"; "bridal suite"; "bridal party"; "bridegroom chamber."

For the Jar Parable, the synonym shifts were not as disparate in the STM *R*s and LTM *R*s: 4–5 words per STM *R*; 5–6 per LTM *R* (Table 8). The synonym shift was lowest in WSR *R*s: 3–4 words per *R*. The important observation here is that the subjects shifted several of the same words in the same ways consistently (Table 11). The shift from "kingdom" to "kingdom of heaven" was quite popular, especially in LTM *R*s where as many as 80 percent of subjects in a particular memory mode made this shift. This shift is the result of preexisting schema, which developed out of knowledge of the gospel tradition. Some substitutions appear to represent popular American dialect:"Filled with" < "full of"; "long way" < "far (away)"; "leak" < "spill/pour/fall"; "arrive" < "get"; "at her house" < "home"; "find" < "notice/realize/discover"; "empty" < "is/was empty/almost gone." Also shifted was the word "meal," to "mead/water/grain/sand/seed/wine." The subjects transmitting by memory appear to have known that the jar was full and became empty (the point of the parable) but showed some difficulty reproducing exactly what was in the jar (a detail). This suggests that the subjects recalled the point of the parable but not nonessential details, and that these details shifted without conscious effort. "Meal" became "water" and "wine" without any intention on the part of the subject to redact the meaning. Two WSR *R*s shifted "meal" to "grain." This shift does not appear to involve the kind of memory distortion just noted but rather a copyist moving arcane language into common American vernacular.

I also observed that subjects in all modes *except WSR* confused certain elements within the parable. The first mention of "she did not realize it" was mixed up with the later reference, "she had not noticed a problem." Because of the close association of these phrases, in all memory-dependent modes the verb "notice" often replaced "realize," and the verb "realize" frequently became "notice," trading places in the phrases.

The *R*s of the miracle story show a roughly equal number of synonyms substituted in STM and LTM *R*s (5–6 per *R*), but only 3 per WSR *R* (Table 9). The substitutions in all modes were consistent: "split" became "cut"; "call out" became "cry/scream/shout/yell." The subjects appear to have consistently avoided reproducing the word "forced" in reference to Jesus making his way through the crowd: this term was either eliminated or shifted to alternatives like "pushed," "rushed," "went," or "came." This replacement

TABLE 14
UNIQUE ADDITIONS TO JAR PARABLE

Media Environment	Additions
OO: STM	None
OO: LTM	She did not realize it was empty until she was at her house. This is what the kingdom of heaven is like.
OW: STM	None
OW: LTM	Carrying a jug of water back from the well The woman filled the jar and placed it on her back not noticing that the jar was broken The jar was full but there was a hole in it
WO: STM	None
WO: LTM	A jug of meal balanced on her head
WW: STM	She is confused She was confused
WW: LTM	When it got a hole She figured out something was wrong
WSR	The meal was leaking out of a hole in the container. It trickled out little by little. All of the meal spilled out

TABLE 15
UNIQUE ADDITIONS TO FOOT MIRACLE STORY

Media Environment	Additions
OO: STM	None
OO: LTM	Jesus was teaching and a man cleaved his foot While Jesus was preaching, a man with a broken foot One day a man Using an axe while trying to chop the wood He pushes his way through the crowd and approached Jesus Jesus says, "Your faith has saved you." And he touched the man's foot and it is healed. And this displayed his power
OW: STM	None
OW: LTM	One time, Jesus was walking and he heard a man scream. "Be healed and remember me." And the man was healed.

TABLE 15 (*cont.*)

Media Environment	Additions
WO: STM	By accident chopped into the sole "Cleave the wood and you are healed."
WO: LTM	One day while Cutting down a tree Accidentally slipped "Believe in me" "Follow me and go"
WW: STM	As fast as he could "Cleave the wood and follow me."
WW: LTM	Drops the axe Was dying from blood loss "Remember me always"

may be the result of a contemporary theological apology on the part of the subjects, whose schema may not know of a Jesus who would "force" anything. "Took hold of" was shifted frequently to alternatives such as "touched," "put his hand on," or "grabbed." Several of the LTM synonym shifts appear to have been affected by other related words in the miracle story. Some subjects replaced "split open" the foot in the beginning of the story with "cleave" while at the same time eliminating "cleave the wood" from the final saying. Another shift was to replace "cleave" in the final saying with "chop" from the beginning of the story. This type of confusion of internal elements, which never occurred in the WSR *R*s, appears to be a signal of transmission involving memory rather than copying.

A fourth notable pattern of instability in the *R*s was *paraphrase*. One of the most surprising findings of these experiments related to the WSR *R*s. There were a few general responses to the WSR exercise.

- Some subjects chose to ignore altogether the direct discourse of Jesus' sayings and developed instead an interpretive homiletic paraphrase of them (Virgin Saying: 9/27; Jar Parable: 15/27).
- Some subjects ignored the written source completely and did not reproduce or paraphrase the presented material (Virgin Saying: 3/27; Jar Parable: 3/27).
- Some subjects reproduced the written versions of the sayings practically verbatim (Virgin Saying: 15/27; Jar Parable: 9/27) while liberally modifying the narrative material, especially in the miracle story.

The subjects who opted for homiletic paraphrase often integrated materials they knew from previous exposure to biblical materials. From their responses, it appears that they struggled to give contemporary meaning to archaic and unfamiliar words of Jesus. It seems that some chose paraphrase so that they could more easily modify and explain material that was for them uncomfortable or unknown. The following instances of homiletic paraphrase may serve as representative examples.

- Christians are those in the kingdom often falling away from Jesus like the meal from the jar. . . . Jesus does not want people to sin. He wants them to retain virginity to go to heaven; but he also forgives sinners, like he did with Judas.
- The virgins in the first story are those who have put the physical world behind them in order to be part of something greater. The woman with the jar lost her "reward" because she wasn't paying attention to what was important, but other less significant things. And the young

man who was healed is told to go back about his business, but always to "remember me." Keeping one's mind focused on higher things is of utmost importance.

- Jesus' second coming marks the end of the world. It will come unexpectedly. As followers we must always be ready and waiting. We cannot be like the woman with the jar full of meal. If we don't watch, by the time we realize, it will be too late. Jesus will come like a thief in the night.
- God was witnessing his kingdom being ruined and destroyed, much like the jar of meal the woman was carrying. God sent Jesus to refill the jar so that his kingdom could be great again. Jesus showed us ways to live our lives so that we may remain in God's kingdom. Rules such as abstinence until marriage were established.
- Jesus wanted to help us, to save us from going down paths that didn't lead to the kingdom. His mission was to get us on track, and "heal our split feet."

These data may suggest that paraphrase is the form of reproduction most consistent with copying or consulting a written text. This appears to be particularly true if the paraphrase involves reflective abstract thinking, commenting at some length on the transmitted material and its meaning or life application. In media environments that rely *solely* on human memory, this type of abstraction and reflection on the presented material does not appear to be primary. What is primary in these instances is the reproduction of the "gist" of the tradition with occasional pithy and concrete interpretive clauses or familiar formulaic phrases to introduce or conclude the material. What I observed in the WSR paraphrases was the move to be analytical, evaluative, and abstract with the transmission of the retained written material rather than concrete and situational.

Having said this, it should be kept in mind that ancient rhetorical training involved teaching young men how to transform a traditional story or aphorism into paraphrase and to point out the moral character of the conventional material. This being the case, it is also true that in these classroom situations, the consultation, memorization, and composition of written speech texts were preparatory to the delivery of the speech. So it remains to be demonstrated that paraphrastic reproduction is *solely* derivative of reliance on written sources, although it surely is a tendency of writers who have in their hands a written source that they are consulting and reflecting upon.

What Does All This Mean?

As I reflect on these experiments and the data they have generated, I am reminded how different experimentation is from theorizing alone. With theory, any reasonable scenario is possible. With experimentation, only scenarios that are supported by the data are possible. In this case, the data says that Rudolf Bultmann's form-critical theory about orality was incorrect because his assumptions were wrong (Bultmann 1962, 1). Although he knew that when narratives pass from mouth to mouth the main point is retained while the details change, Bultmann also believed that there was an original "pure form" of the narrative (Bultmann 1963, 4–5). The oral traditioning process resulted in the transmission of material from original simplicity and purity to versions of increasing complexity and length. In Bultmann's view, it is possible to recover the pure form by removing the later "Hellenistic" layers that had overlaid the primary "Palestinian" original (Bultmann 1958, 12–13).

In the oral traditioning process, however, Jesus traditions (including proverbs) were not expanded, except for an occasional new detail or brief interpretive clause tacked onto the end of the teaching. Instead, the traditions in the oral environment suffered drastic condensation and remodeling until a) they became fixed oral traditions that could easily be passed on intergenerationally with little variation, or b) they entered liturgy, or c) they were copied as sacred texts. Although it might be possible to detect some secondary features in the scribed Jesus traditions—since received material, upon each oral or written performance, is remodeled for a new time and place and purpose (see DeConick 2005; 2006)—any hope of recovering a pure originating oral form (if there ever was one) is dashed.

The idea that the verbatim words of Jesus, or any other "originating" oral source, can be recovered must be tossed out. There is no experimental data that can support this search for "the original," unless we envision a situation where the presented material was passed on immediately upon hearing from one person to the next, or where Jesus' words were scribed down as he spoke and then memorized. Further, in both cases we would have to imagine that the transmitted material was remembered with 100 percent accuracy on the part of the traditioners. Neither of these scenarios seems historically plausible or even possible.

My experimental data did not show any defining characteristics of different media environments where human memory was involved except that STM *R*s in the same media environment (OO and WW) were more accurate than mixed environments (OW and WO). This accuracy degraded

completely in LTM *R*s. All media environments that depended on human memory consistently showed that deletion of the presented material was highest in terms of the amount of distortion per *R*. The number of added words and synonym substitution held middle ground. Transpositions of words and phrases and changes in number, tense, and pronouns were minimal. The important point for any discussion of source derivation and dependence is that these memory distortions were consistent throughout the presented material. One of the distinguishing characteristics of literary material that has been derived through a media environment that is dependent upon human memory (OW and WW) is that these sorts of distortions should be consistent throughout the parallel in question. In addition, not only were these memory distortions consistent internally—that is, in any given *R*—but also across *R*s. This means that the same alterations across texts may have absolutely nothing to do with the conscious editorial policy of a redactor or reliance upon the same source.

The data also suggests that when the text in question shows a tendency to preserve the words of Jesus more accurately than the surrounding narrative, the author likely had consulted a written source. This manner of reproduction is not unique to Christian authors. It appears that the words of heroes were retained (near) verbatim in similar but variable literary contexts, too. The recitation composition found in three versions of Plutarch's recounting of Lysander's use of his sword is demonstrative of this principle (see Robbins 1991, 149–51).

Other signs of literary dependence include verbatim strings of sixteen or more words and exact reproductions of sayings and narratives. I did not observe WSR *R*s confusing similar elements within the presented material as was constantly done in LTM *R*s dependent on memory ("noticed" < "realized"; "realized" < "noticed"; "chopped" < "cleaved"; "cleaved" < "chopped"). Authors who were able to consult a written document exercised the choice to paraphrase and also tended to move the presented material into larger interpretive contexts, dialogues, and homilies. These tendencies were not observed in the memory-dependent *R*s, which appeared content to recall the gist of the presented material. Deep reflections on the presented material and abstractions were not observed in the memory-dependent environments. Whether such reflections and paraphrastic constructions are also common in memory-dependent environments should be tested in the future.

These conclusions also suggest that several of the synoptic sequences considered "ambiguous" by McIver and Carroll should be understood as further evidence that the synoptic problem is mainly a problem of literary dependence. To their seven certain instances of "copying" in the Synoptics,[7] we can add at the very least Mark 1:24-25//Luke 4:34-35, Matthew 8:20//Luke 9:58, Mark 12:38-40//Luke 20:45-47, Matthew 8:9//Luke 7:8, and Mark 10:13-16//Luke 18:15-17. All these cases are examples of parallels where there are lengthy verbatim strings of words, and all reflect a tendency to reproduce Jesus' words accurately while dramatically modifying the surrounding narrative.

What remains ambiguous are those texts that show variance—especially deletions, additions, and synonym shifts—since this sort of distortion also can be the result of memory distortions or modifications of a written source that has been consulted. This is particularly the case for narrative materials and even parables. However, when a written source is being consulted and the proverbial words of the hero reproduced (rather than paraphrased or moved into indirect discourse), the *R*s do not show the same quantity, quality, and consistency of distortions that occur when the tradent is relying on long-term memory.

Even though these findings should be tested further, the results of these pilot experiments are in line with the results of other experimental data that have been produced by psychologists who study human memory. This fact has broad implications for any theory proposing to establish the historical accuracy, authenticity, or reliability of the gospels as eyewitness testimony. To trust the eyewitnesses because testimony asks to be trusted is nonsense. Whatever memories are preserved in the gospels, they are reconstructed and highly interpreted memories. It is distressing to see a renowned scholar like Richard Bauckham so easily dismiss the work of Bartlett and misappropriate the vast literature on false memories by concluding that "the eyewitnesses behind the gospel accounts surely told what was prominent in their memories and did not need to attempt the laborious processes of retrieval and reconstruction that make for false memories" (Bauckham 2006, 356).

More specific applications of the results of my experiments may help us think more deeply about the synoptic problem and may shed new light on discussions of the *Gospel of Thomas* as a text *literarily* dependent upon the Synoptics. It is my firm opinion that the time has come for the theory of *Thomas*'s literary dependence to be put to bed. More suitable solutions and explanations emerge when we do not ignore experimentation as a means to inform our research, solutions that take seriously the centrality of human memory by recognizing the enormous footprint it has left behind in the early Christian literature.

JESUS, THE VOICE, AND THE TEXT

Beyond The Oral and the Written Gospel

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