

# The Value of Memory: Historical, Torah, and Educational Perspectives

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## ***Introduction***

Memory is the bridge between the past and the present, and the present and the future. Without memory, humans would be like trees without roots; people would experience the present, but without a foundation upon which to build. It allows humans to process knowledge and store it for later use. Tremendous value has been placed on memory throughout the ages. From Chazal, to medieval times, and up until modern-day psychology and educational studies, it is clear that memory has been assigned immense value. This is because memory allows humans to grasp information and to build upon it. When committed to memory, knowledge shifts from being external information alone to becoming part and parcel of the person. Memory shapes the perspective and path of both the individual and the community.

Jewish tradition is filled with directives to engage the human memory. The root *zakhar*, to remember, appears more than 150 times in the Torah.<sup>1</sup> As a nation, the Jewish people are commanded to remember the Exodus from Egypt, to remember Amalek, and there is even an entire section of Torah predicated on memory, the Oral Torah. As individuals, Chazal discuss the value in remembering one's Torah learning and offer strategies for how to do so. Torah is the centerpiece of Jewish life-- it acts as a roadmap for one's life, it shapes the community, and allows a person to engage in a relationship with G-d. Therefore, Chazal placed great emphasis on remembering Torah.

Because memory in the Jewish tradition is such an expansive topic, this study will focus particularly on the relationship between memory and Torah learning. We will explore the origins of memory in the ancient and medieval periods and then look at rabbinic literature in order to further clarify the value that the Torah places on remembering one's learning. We will discuss a

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<sup>1</sup> Yerushalmi, *Zakhor*, 5

number of memory tactics that Chazal used, including using *simanim*, verbalizing one's learning, and practicing consistent review. These memory techniques will then be studied through the lens of modern education and memory studies. To conclude, we will apply this research to study how the memory strategies that were put forward by Chazal can be applied to the classroom, with the goal of teaching students how to effectively retain their Torah knowledge.

### ***The Value of Memory***

In ancient and medieval cultures, memory was a cornerstone of societal achievement. Those with trained memories were celebrated, and those who had the best memories were considered to be the most intelligent. The entire society was founded upon principles of memory. In modern society, however, the value in memory has been lost. When technology is at our fingertips, memory begins to seem unnecessary. One can access all the information in the world with the mere click of a button, and anything one has to know can be accessed through a simple Google search. So, why is memory important? In his book on memory, *Moonwalking with Einstein*, the journalist Joshua Foer asks this question. He says that without memory, students are lacking a basic sense of cultural literacy. Further, on a personal level, how many times do we forget one item from the shopping list, or on which street we were supposed to make a right turn? These are simple, basic pieces of information that humans are certainly capable of remembering. However, in today's age our minds are not trained to remember. Foer sets the stage for our study of the history of memory, as he writes, "People used to labor to furnish their minds. They invested in the acquisition of memories... how, I wonder, did our culture end up forgetting to remember?"<sup>2</sup>

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<sup>2</sup> Foer, *Moonwalking With Einstein*, 134

Memory was a centerpiece of medieval culture. In *The Book of Memory*, Mary Carruthers explains that all of medieval culture depended on memory. In the times before large printing presses and modern technology, human memory was the most valuable source of knowledge and wisdom. Carruthers proposes, however, that memory is not only a matter of practicality, but also of morality and character. Even after printed books became readily available, there was still an important emphasis placed on memory.<sup>3</sup> As she eloquently writes, “Training the memory was much more than providing one's self with the means to compose and converse intelligently when books were not readily at hand, for it was in trained memory that one built character, citizenship, judgement, and piety.”<sup>4</sup> Carruthers posits that memory is not merely about memorizing information, but about training oneself to retain the knowledge that can be used to lead a moral life and to shape society. She explains that training the memory was a matter of ethics and character refinement.<sup>5</sup> Individuals with extraordinary memory were given honor because their knowledge allowed them to both engage in intellectual pursuits and refine their characters.

Indeed, there were professional memorizers in every culture, since this was an important way of transmitting culture. There were the Jewish Tannaim who were masters of the Oral Tradition, Priests in India who memorize the Vedas, and students who committed the Buddha's teachings to memory, until they were written down in Sri Lanka.<sup>6</sup> Culture becomes rich through the layers that are added by each generation. Memory of the past builds the basis for the cultural developments of today.

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<sup>3</sup> Carruthers, *The Book of Memory*, 11

<sup>4</sup> Ibid., 11

<sup>5</sup> Ibid., 14

<sup>6</sup> Foer, 125

Besides for the ethical and cultural value in memory, training one's memory has immense practical benefit as well. Carruthers cites Frances Yates who writes, "All learning depends on memory."<sup>7</sup> Yates argues that information cannot exist in the human mind in scattered, fragmented pieces. If one does not have a framework in which to place the new information, it will remain meaningless. The new information must build upon previous knowledge in order to become meaningful, and this requires memory. Yates writes, "It is memory which makes available to us the reserve of examples, laws, rulings, sayings, and facts which the orator must possess in abundance and have always at his finger-tips."<sup>8</sup> To know something is not to have heard it spoken, but rather to have it committed to memory. When information becomes ingrained in one's mind, it becomes part of his person, and as Yates describes, the information is readily available at his fingertips. Raemon Mathews, an educator in the Bronx, dispels the common notion that there is a dichotomy between learning and memorizing. People often praise learning, as it is an experience of gaining and appreciating new information, while they condemn cold, rote memorization. However, Mathews argues that to gain knowledge, one must have knowledge. Only through the vehicle of memory can one fully grasp knowledge and thereby apply it to further learning.<sup>9</sup>

Yates adduces an old Egyptian folktale which reflects this notion that information must be committed to memory. The story goes as follows: There was an Egyptian king named Thamus, who was visited by Theuth, the Egyptian god of writing. Theuth came to joyfully inform the King that he has a new branch of learning that will help people remember everything. This new branch of learning was, of course, writing. The Egyptian king responded, "You have

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<sup>7</sup>Carruthers, 92

<sup>8</sup> Cited in Carruthers, 92

<sup>9</sup> Foer, 195

invented an elixir not of memory, but of reminding; and you offer your pupils the appearance of wisdom, for they will read many things... but only appear wise.”<sup>10</sup> The Egyptian king contends that writing will give people the false impression of having knowledge, when in fact they are merely reading information off a slate. As Yates explained, when information remains external it is not true knowledge; only once it is committed to memory does it become part of a person. The power of the written word is that it will not be forgotten, but as King Thamus argues, it may be that writing actually causes humans to forget more.

### ***Torah Value of Memory***

The old Egyptian folktale sheds light on a major shift that occurred in Jewish history, regarding the nature of the Oral Torah. The Talmud in Gittin (60b) brings two parts of the verse in Exodus 34:27 that seem to contradict each other. When Hashem is giving the Torah to Moshe, He tells Moshe, “Write for yourself these words,” implying that the Torah should be written. The verse concludes that, “For on the basis of (*al pi*) these words I have executed a covenant with you and the Jewish people,” which implies that Torah should be passed down orally, as indicated by the language of *al pi* (lit. by mouth).<sup>11</sup> The Talmud resolves this contradiction by positing that the Written Torah may not be recited orally, and the Oral Torah may not be written down.<sup>12</sup>

If so, however, how did it come to be that the entire Mishnah and Talmud were in fact written down, if they were meant to be the Oral Law? Echoing earlier rabbinic sources, Yosef Hayyim Yerushalmi writes that it was not the ideal for the Oral Law to be written, but was rather a matter of necessity. The Jewish people were incapable of learning the entire Oral Torah by

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<sup>10</sup> Yates, *The Art of Memory*, 52

<sup>11</sup> Shemot 34:17

<sup>12</sup> Gittin 60b; also found on Temurah 14b

heart. Had it not been written down, it would have become lost over the generations.<sup>13</sup> The Rambam agrees that orality is the best way to master Torah, and he therefore structured his work, the *Mishneh Torah*, in a clear and concise manner that is conducive to memorization.<sup>14</sup> The author of the *Orchot Tzadikim*<sup>15</sup> writes that because the Romans had completely overwhelmed the land of Israel, and there were fewer and fewer capable students to be found studying in *yeshivot*, Rabbi Yehudah HaNasi decided (c. 210 CE) that the Oral Torah had to be written down in order to preserve it.<sup>16</sup> As Rashi explains on Gittin 60b, the Talmud was written down only because otherwise, it would have been forgotten.<sup>17</sup> It was not meant to write down the Oral Torah; rather, the ideal was to pass it down through memory. Each generation was meant to commit the Oral Torah to memory and pass it along to the next generation. Perhaps this shift in the Oral Torah parallels the old Egyptian folktale of King Thamus. When something is written down, people will not work as hard to remember it. It will indeed be preserved for generations, but there is a level of orality that will inevitably be lacking. Both in the ancient world and the Torah, there is a tremendous value placed on orality and memory.

In order to better understand the Torah's perspective on the value of memory, we will begin with its view on the opposite-- forgetting. In the Mishnah in Avot (3:8), R' Dostai states, in regard a person who forgets even one piece of information from his learning, that the Torah treats him as if he is liable to the death penalty.<sup>18</sup> The fifteenth-century Italian rabbinic scholar, R. Ovadiah Bartenura suggests in his commentary to the Mishnah, that this statement should be

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<sup>13</sup> Yerushalmi, 32

<sup>14</sup> Although he himself produced a written work, Rambam holds that orality is preferable. Rambam writes in his introduction that he specifically wrote the book in a manner that its content can be easily memorized. (Twersky, 72-73, 112)

<sup>15</sup> The author of the *Orchot Tzadikim* is unknown; it was composed in either France or Germany, during the late fourteenth or early fifteenth centuries.

<sup>16</sup> *Orchot Tzadikim, Gate of Torah*

<sup>17</sup> Rashi on Gittin 60b s.v. *u'devarim she'beal peh 'i ata rashai l'kotvan*

<sup>18</sup> Avot 3:8

taken literally. He explains that if a person does not review his learning, he will come to mix up halachot and accidentally violate Torah prohibitions. Once he violates Torah prohibitions accidentally, he will eventually begin to sin purposefully, and thus he will be liable to the death penalty.<sup>19</sup> Rabbeinu Yonah of Gerona (d. 1263) adumbrated the Bartenura's approach, adding that if one does not review his learning, he will come to mix up halachot, and thereby violate Torah prohibitions. Forgetfulness is common in people, so one should be careful to review his learning many times over so that he does not forget it.<sup>20</sup> In his view, a scholar does not have the right to be passive and let himself forget his Torah learning, but rather he is obligated to constantly review, in order to ensure that he knows the full scope of Jewish legal teachings (*halakhot*) and can issue proper rulings.

The Talmud in tractate Menahot (99b) further discusses the severity of forgetting one's learning. The Gemara presents a three way-argument about this problem. The verse in Devarim 4:9 states, "Only beware for yourself, and greatly beware for your soul, lest you forget the things that your eyes have seen, and lest you remove them from your heart..."<sup>21</sup> The Amora Reish Lakish says that this verse teaches that a person who forgets even one thing from his Torah learning violates a Torah prohibition. Ravina argues that by using both "beware" and "lest", the Torah is teaching that there are actually two Torah prohibitions involved. Going even further, R' Nachman bar Yitzchak maintains that by using the words "beware," "lest," and "beware," the Torah teaches that there are three distinct Torah prohibitions against forgetting one's learning. These three Amoraim clearly agree, however, that the Torah explicitly warns against forgetting one's Torah learning. The Talmud in Menahot (99b) continues by noting that just as a person is

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<sup>19</sup> Bartenura on Avot 3:8

<sup>20</sup> Rabbeinu Yonah on Avot 3:8

<sup>21</sup> Devarim 4:9, translation from footnote in Artscroll Menachot 99b



created in 40 days, so too the Torah was given in 40 days. Thus, one who guards his Torah learning, will have his soul guarded; but if not, his soul will not be guarded.<sup>22</sup> Just as Rabbeinu Yonah explained that one must actively review his learning, the Talmud in Menahot (99b) asserts that a person must actively guard his Torah learning. The Torah provides a strong imperative to remember one's learning, warning that if he does not he will be in violation of Torah commandments.

The Talmud in tractate Sanhedrin (99a) presents two parables that illustrate the loss involved in forgetting one's learning. Rabbi Yehoshua ben Karcha states that one who forgets his learning is comparable to a person who plants a field but does not harvest it. Rabbi Yehoshua says he is comparable to a woman who gives birth and buries her child.<sup>23</sup> In a similar vein, the Talmud in tractate Eruvin (54b) presents Rav Shizbi's statement that one who does not review his learning is similar to an ineffective hunter, who hunts without holding onto what he caught.<sup>24</sup> These three analogies highlight that even if a person puts considerable effort into learning Torah, it may all be for naught if he does not retain the information that he has learned.

It is worthwhile to explore why the talmudic sages chose these specific analogies. Psalm 126 (familiar to many from the Grace after Meals prayer) states, "Those that sow in tears shall reap in joy."<sup>25</sup> This verse describes the pain and labor that goes into planting, but concludes that it will be worthwhile for the joyous harvest that awaits. A person who learns but forgets is similar to one who plants but does not harvest; he is destined to live an intellectual life of tears as he will never reach the point of "reaping in joy." Similarly, the coming of the Messiah foretold in

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<sup>22</sup> Ibid.

<sup>23</sup> Sanhedrin 99a

<sup>24</sup> Eruvin 54b

<sup>25</sup> Psalm 126

many liturgical texts to be preceded by “labor pains.”<sup>26</sup> The world must first experience suffering and pain, but that pain will herald the coming of the Messiah. A mother who goes through the pains of labor but then buries her child has experienced suffering, but does not receive her precious product in the end. The Rabbis of the Talmud use these analogies to convey that one who learns but does not remember is likened to someone who experiences hardship but is unable to reap any benefits from his efforts.

Since forgetting one’s learning is so potentially deleterious, one needs to review his learning constantly. A number of rabbinic sources discuss the needs to maintain a strong grasp of one’s Torah learning. The requirement to teach one’s children Torah is expressed by the verse in Devarim 6:7, “And you shall teach them (*v’shinantem*) to your children and speak of them when you sit in your house...”.<sup>27</sup> Notably, the verse does not use the Hebrew verb *v’limadtem* (to teach), but rather *v’shinantem*, which literally means to repeat. The Re’em<sup>28</sup> quotes the Sifrei which says that the specific use of the word *v’shinantem* teaches the obligation not only to teach, but to repeat over and over again, until it becomes fully sharpened in your mouth (i.e., in the way that you are able to express it).<sup>29</sup> Rashi on this passuk quotes the Talmud in tractate Kiddushin (30a) which explains that the word *v’shinantem* teaches that one must know his learning so well that if someone asks him a question about it he will not hesitate to answer.<sup>30</sup> Rashi on Kiddushin 30a explains that in order to do so, one must review his learning until he reaches the level of being able to answer the question immediately.<sup>31</sup> The Torah holds each person to a high standard

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<sup>26</sup> For example, see the last paragraph of the Shabbat Zemer, *Mah Yedidut*.

<sup>27</sup> Devarim 6:7, translation from chabad.org

<sup>28</sup> Rabbi Eliyahu Mizrahi (1435-1526 in the Ottoman Empire). He was an acclaimed rabbi and scholar, and a leading commentator on Rashi’s Torah commentary..

<sup>29</sup> Quoted in Chiddushei Halachot on Kiddushin 30a

<sup>30</sup> Rashi on Devarim 6:7, s.v. *v’shinantem li’baneckha*; Kiddushin 30a

<sup>31</sup> Rashi on Kiddushin 30a, s.v. *yehu mehudadin b’pikhah*

by requiring that one knows his Torah learning to a point where he never hesitates to answer a question.

A central goal of Torah learning is that the Jewish people will live their lives according to the Torah, and this can only be fully accomplished if one remembers what he learns. The Talmud in Kiddushin (40b) asks the question, “Which is preferable, learning (*limmud*) or doing (*ma’aseh*)? The Talmud there concludes that learning is more important because it leads to doing.<sup>32</sup> Rashi explains that learning is preferable because it will lead to a person to both learn and do.<sup>33</sup> The Talmud is teaching that the goal of Torah learning is to be able to practice halakhah in the proper way. Torah education should not be a mere intellectual exercise, but rather a preparation to live a halakhic life. As *Sefer Hasidim* (Germany, early thirteenth century) recommends, “The young student...should not necessarily approach these texts as a budding dialectician or Tosafist but as a good Jew.”<sup>34</sup> As Y. H. Yerushalmi notes in his *Zakhor*, the word *halakhah* comes from the hebrew root of *halikhah*, which means walking. He posits that people remember halakhot which they practice, because through practice they become ingrained in one’s daily routine.<sup>35</sup> Rabbi Dr. Norman Lamm calls this concept the functional definition of *Torah lishmah*, which means to study in order to do.<sup>36</sup><sup>37</sup> A principal function of learning Torah is to be able to practice, and in order to practice, one must remember.

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<sup>32</sup> Kiddushin 40b

<sup>33</sup> Rashi on Kiddushin 40b, s.v. *she’hatalmud mevi l’ydei maaseh*

<sup>34</sup> Kanarfogel, *Jewish Education and Society in the High Middle Ages*, 41

<sup>35</sup> Yerushalmi, 115

<sup>36</sup> Lamm, *Torah Lishmah*, 191-192

<sup>37</sup> As delineated in Rabbi Lamm’s *Torah Lishmah* (206-208), this definition of *Torah lishmah* is adopted by the Amora Rava (Talmud Bavli, Berakhot 17a), the Tannaim Rabbi Shimon bar Yohai and Rabbi Yohanan (Talmud Yerushalmi, Berakhot 3b), the kabbalists R’ Elijah de Vidas (author of *Reshit Hokhmah*) and R’ Isaiah Horowitz, and others.

Rabbi Dr. Lamm presents a second definition of Torah *lishmah* called the devotional definition, which also reflects a central goal of learning Torah.<sup>38</sup> The devotional definition of Torah *lishmah* is learning Torah out of love for Hashem.<sup>39</sup> The Rambam expounds that a person should not learn Torah for the sake of wealth or honor, but rather out of love for the Almighty.<sup>40</sup> The motivation to learn Torah should come from a genuine desire for a close relationship with Hashem. Later, the Rambam writes that a person can only love something according to the measure that he knows it. He explains that having intimate knowledge of something will increase one's affinity towards it.<sup>41</sup> With this, we may say that in order to arrive at a greater love of Hashem, a person should study His Torah with great depth and devotion. It is only according to the measure of knowledge of Torah that one can feel a sense of love towards Hashem. Memory plays a central role in concretizing knowledge of Torah, and thereby allowing one to further his understanding and love of the Almighty.

In order to further one's learning, the student must have a foundation or reservoir of knowledge on which to build. This knowledge base can only be formed through review and memory. Often referred to as a debate over whether learning *bekiut* (more broadly) or *b'iyun* (in depth), the Rabbis of the Talmud charted the balance between emphasizing rote memorization and pursuing more advanced analytical skills. The Talmud in tractate *Berakhot* (64a) presents the foundational *sugya* for this discussion. In the academy at Pumpedita, they needed to appoint a new Rosh Yeshiva. The candidates were R' Yosef, who was called Sinai because of his encyclopedic Torah knowledge, and Rabbah, who was known as an *Oker Harim* (lit. one who

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<sup>38</sup> Rabbi Dr. Lamm also puts forth a third definition of *Torah lishmah* called the cognitive definition, which will not be addressed here.

<sup>39</sup> Lamm, 192

<sup>40</sup> Rambam Hilkhos Teshuva 10:4

<sup>41</sup> Ibid. 10:6

could uproot mountains) because of his sharp analytical skills. It was concluded that R' Yosef would be the appropriate Rosh Yeshiva.<sup>42</sup> Rashi on Sanhedrin 42a explains that the Sinai characteristic is preferable, because a sharp analytical question can often be answered by an explicit teaching that comes up elsewhere in the Mishnah or Talmud.<sup>43</sup> Tosafot on Eruvin agrees that Sinai would be preferable to *Oker Harim*.<sup>44</sup> The expansive base of knowledge that R' Yosef possessed allowed him to properly analyze questions and provide accurate halachic rulings, thus deeming him fit to be the Rosh Yeshiva.<sup>45</sup> The commentators debate whether the same decision would be made in modern times. Rabbi Shlomo Kluger (Ukraine, d. 1869) argues that when so many earlier *sefarim* (books of talmudic and rabbinic teaching and interpretations) are readily accessible, it is more valuable to develop and to have strong analytical skills.<sup>46</sup> Rav Ovadiah Yosef (Iraq and Israel, 1920-2013), on the other hand, maintains that Sinai is still preferable nowadays.<sup>47,48</sup>

Many rabbinic prominent figures believed that the more recent shift away from memorization has been detrimental to Torah learning. In his chapter on *Limud HaTorah* in *Even Shleimah*, R. Elijah b. Solomon of Vilna (known by the acronym Gra, 1720-197) says that one should first fill his stomach with Tanach, Midrash, Mishnah, and Gemara before beginning to learn *pilpul*, analytically. Simply put, a person must first develop a base of knowledge before he

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<sup>42</sup> Berakhot 64a; Horayot 14a

<sup>43</sup> Rashi on Sanhedrin 42a, s.v. *milkhamta shel Torah*

<sup>44</sup> Tosafot Eruvin 40a, s.v. *a'data d'kulhu rabbanan ka'atu*

<sup>45</sup> Although it was decided that R' Yosef should be the Rosh Yeshiva, R' Yosef initially declined the offer, and he only took over after the death of Rabbah (Berakhot 64a; Horayot 14a).

<sup>46</sup> Rabbi Shlomo Kluger, *Hagahot to Eshel Avraham*, OC 136; Cited in Yehudah Rosenberg's article, *Berakhot 64: Sinai and Oker Harim*

<sup>47</sup> Introduction to *Yabia Omer*; *Yabia Omer*, 7:1:8

<sup>48</sup> This is fitting in light of Rabbi Ovadiah Yosef's methodology, as his goal is not to analyze complicated sugyas, but rather to provide clear halachic rulings (Sinensky, *Iyun and Bekiut*).

can apply analytical skills.<sup>49</sup> This comment of the Gra is supported by the talmudic passage in tractate Shabbat (63a), in which the Amora Rav Kahana says that he finished learning all of the Talmud by the time he was eighteen years old.<sup>50</sup> One should learn all of the basic information necessary to begin, and only then move forward to more advanced styles of learning. Even Rav Chaim Soloveitchik Brisker (Lithuania, 1853-1918) who was perhaps the best-known rabbinic figure in his day for his exceptionally sharp analytical skills, maintains that one who learns *pipul* without the requisite *bekiut* knowledge is akin to a person blowing hot air.<sup>51</sup>

In a letter written by Rabbi Shimon Fuerst of Vienna in 1751, he says that the greatest rabbinic scholars of the medieval (*Rishonim*) and modern periods (*Aharonim*) composed their commentaries only after complete mastery of the entire Talmud, and certainly the particular tractate on which they were commenting.<sup>52</sup> Rabbi Fuerst claims that in order to learn in depth, one first needs to have a sufficient breadth of knowledge on the topic. For example, the Tosafists are well known for their didactical analytic methodology, in which they compare sugyas that appear to be contradictory and resolve those discrepancies. It is said that the students of the leading northern French Tosafist R. Isaac (Ri) b. Samuel of Dampierre (d. 1190) had a group of sixty students in his study hall, each of whom mastered one talmudic tractate by heart, and they then would raise challenges on each other's interpretation based on the intimate knowledge that they possessed of the tractate in which they specialized.<sup>53</sup> Even the greatest of Torah scholars

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<sup>49</sup> Vilna Gaon, *Even Sheleimah*, *Limmud HaTorah* 8:2; a number of primary sources, including this one, were found in Rabbi Jonothan Rietti's *One Minute Masmid*.

<sup>50</sup> Shabbat 63a

<sup>51</sup> Cited in Rabbi Rietti's *One Minute Masmid*, location 1213 in Kindle edition

<sup>52</sup> Rabbi Shimon Fuerst, *Give Honor to the Torah*; cited in Rabbi Rietti's *One Minute Masmid*, location 1843

<sup>53</sup> Introduction to Menahem Ibn Zerah, *Zedah La-Derekh*; this may be a more legendary account, but it nonetheless reflects the idea that one must first master knowledge before moving forward to complex analysis.

began with memorization and mastery of information, before moving on to developing advanced analytical skills.<sup>54</sup>

The Midrash on Mishlei 30:1 asserts that when a person reaches the World to Come, he will be asked on the day of judgement to recite all of his Torah learning.<sup>55</sup> He will not have available to him any resources, but rather he will be asked to recite all that he has learned by memory. This daunting Midrash highlights the importance of reviewing one's learning while he is alive. The Talmud in tractate *Ketubot* 62b teaches that Torah scholars deprived themselves of sleep as they stayed up late at night to toil in their learning, so that they would be prepared for the World to Come.<sup>56</sup> In the World to Come, Torah scholars will be praised for their wealth of knowledge. The Talmud in tractate *Pesachim* (50a) recounts the story of R' Yosef the son of Rabbi Yehoshua ben Levi who became weakened and ill and ascended to Heaven, but then returned. Upon his return, his father asked what he saw when he was there. R' Yosef responded that he saw an upside down world, where people who are prominent in this world were lowly in Heaven, and people who were lowly in this world were raised in Heaven. His father asked, "And what about Torah scholars like us?" to which R' Yosef responded, "I heard them saying, 'Praiseworthy is he who comes here with his Torah learning in his hand.'"<sup>57</sup> The benefits of remembering one's learning are reaped in both this world and the World to Come.<sup>58</sup>

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<sup>54</sup> There is a parallel debate among modern educators over the balance between teaching straight facts and more advanced analytic skills. John Dewey, a prominent educational reformer (lived 1859-1952), advocated for a shift away from memorization and towards experiential learning. In response, critic E.D. Hirsch Jr. argued that without memorization, students will lack the basic important knowledge needed to enter the world (noted in Foer's *Moonwalking with Einstein*, 194). Although many education systems today have shifted away from rote memorization, it is not evident that it has been an effective change.

<sup>55</sup> Quoted in Rabbi Rietti's *One Minute Masmid*, location 906

<sup>56</sup> *Ketubot* 62b

<sup>57</sup> *Pesachim* 50a; a similar story is found on *Ketubot* 77b

<sup>58</sup> Although remembering one's learning is greatly valued, the mere act of Torah learning is also valuable. The Talmud on *Chagigah* 9b says that we cannot compare one who reviews 100 times to one who reviews 101 times. Rabbi Tzvi Sinensky, in his article *Reviewing One's Learning* explains that there is no practical difference between reviewing 100 and 101 times; rather, the Talmud is emphasizing the spiritual benefit in reviewing one's learning, as

### *Models of Memory*

Before delving into practical memory strategies for retaining Torah study, it is worthwhile to briefly study several diverse human models of memory. These figures, who achieved great success in developing their own powers of memory, will help us to build a foundation for the study of practical memory techniques. There were professional memorizers in all cultures who committed the foundational teachings of their religions to memory.<sup>59</sup> In the Talmud, there are personalities who are renowned for their extraordinary memories. The Amora R' Yosef was said to have an encyclopedic knowledge of Mishnayot and Braitot; in fact, there are forty two Braitas that would not have been preserved if not for the memory of R' Yosef.<sup>60</sup> He was called a 'Sinai' because his knowledge of sources was as vast as the Torah given at Har Sinai.<sup>61</sup> Similarly, R' Sheshet was known for his greatness in accumulating vast Torah knowledge. Indeed, the Talmud in tractate Eruvin (67a) recounts says that R' Chisda's lips would tremble from the vast and encyclopedic knowledge of R' Sheshet,<sup>62</sup> while a passage in tractate Shevuot (41b) recounts that R' Nachman testified to R' Sheshet's fluency in Mishnah, Sifra, Sifrei, Tosefta, and the entire Talmud.<sup>63</sup> Both R' Yosef and R' Sheshet were known as

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the act of review shows a person's commitment to Torah. In fact, there is a shocking Midrash (Kohelet Rabbah 1:13) that suggests that it is better for a person to forget his learning, so that he will be forced to review and thus he will be constantly engaged in Torah study. The Midrash suggests that Torah study is not merely an intellectual pursuit, but also a way to engage in a relationship with Hashem. Although we have highlighted the practical benefits of review, these sources illustrate the additional spiritual value of review.

<sup>59</sup> As mentioned earlier, there were the Jewish Tannaim who carried down the oral tradition, the Indian Priests who memorized the Vadas, and Budha's students who committed his teachings to memory until they were written down in Sri Lanka.

<sup>60</sup> Artscroll's *Introduction to the Talmud*, 352

<sup>61</sup> Rashi on Berakhot 64a, s.v. *Sinai*

<sup>62</sup> Eruvin 67a

<sup>63</sup> Shevuot 41b; as cited in Artscroll's *Introduction to the Talmud*



giants of Torah memory, and their tremendous knowledge of sources earned them credibility and standing even above that of great Torah scholars.<sup>64</sup>

Another model of memory comes from the more recent past<sup>65</sup> when there lived a man with a truly extraordinary memory. Solomon Shereshevsky (often referred to in literature as just S) was studied by a Russian psychologist, Alexander Luria, whose findings are compiled in his book, *The Mind of a Mnemonist*. Luria found that S had an unprecedented and unparalleled memory. He had the capacity to remember complex mathematical formulas without any background knowledge in mathematics, to memorize Italian poetry verbatim without knowing Italian, and to remember strings of numbers that were thousands of digits long-- and he was able to recall all of this information, sometimes even sixteen years later.<sup>66</sup> Mary Carruthers explains that S was able to accomplish these memory feats by converting the information to be memorized into mental images.<sup>67</sup> S demonstrates that the human mind is capable of accomplishing great feats in memory, feats far greater than one could ever imagine.

In modern times, there have been a number of memory champions who trained their minds to accomplish feats of memory. In Foer's *Moonwalking With Einstein*, he tells the story of his journey from being a journalist to becoming a World Memory Champion. In memory competitions, such as the USA Memory Championship, contestants are given a series of challenges that test their memories. In one event at the 2006 USA Memory Championship, the contestants were given a packet containing 99 names and faces, and after 15 minutes were asked to recall as many first and last names that they can and to match names to the faces. The winner

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<sup>64</sup> It is noteworthy that both R' Yosef and R' Sheshet were blind, so it is perhaps because of their physical impairments that they were motivated to commit their learning to memory; this is noted about R' Yosef in Tosafot on Bava Kamma 3b s.v. *k'metargem*

<sup>65</sup> The late nineteenth and early twentieth centuries

<sup>66</sup> Foer, 24

<sup>67</sup> Carruthers, 92

of this competition was a seventeen year old girl who was able to recall 124 and last names and match them to their faces. In another competition, the competitors were timed in order to determine who could memorize the order of a deck of playing cards most quickly. In the 2006 competition, Foer won with a record-breaking time of 1 minute and 40 seconds. Other events at the memory competition included memorizing long strings of digits, lines of poetry in various languages, and lists of random words.<sup>68</sup> The people who compete in these memory competitions spend years training their memories, and the feats they accomplish through employing memory tactics is truly remarkable.

All of these memory models, R' Yosef and R' Sheshet, Luria's S, and USA Memory Champions, demonstrate extraordinary abilities to remember vast amounts of information. The question then arises, can normal people achieve these heights in memory? Although these memory models are daunting, there are actually many memory techniques that can be used to train one's memory to accomplish feats beyond what we might imagine to be possible. Among these memory techniques are mnemonic devices, verbalization and kinesthetic learning, and consistent and spaced review. However, even before understanding the various memory techniques, the first step to achieving greatness in memory is to have a proper mindset, which can serve as foundation for success.

In his introduction to the *Gate of Torah*, the anonymous author of the Orchot Tzadikim discusses two key factors for retaining one's Torah knowledge: Commitment and strategy. He explains that a person must be completely committed to learning and reviewing Torah; and in order to be the most effective, one should use strategic memory techniques.<sup>69</sup>

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<sup>68</sup> Foer, Chapter 11

<sup>69</sup> Orchot Tzadikim, *Gate of Torah*

To further pinpoint the necessary level of commitment, the Vilna Gaon suggests that we can look to Avot D'Rabbi Natan 6:2, which tells the inspiring story of Rabbi Akiva. Rabbi Akiva was forty years old and had not yet learned any Torah. One day, he saw a well and asked how the rock became hollowed out. A man responded to him that each and everyday water would fall on the rock, and drop by drop, the rock eventually became hollowed out. Rabbi Akiva took a *kal v'chomer* to himself; if a rock is hard and water which is soft was able to penetrate it, then of course Torah which is sharp should be able to penetrate his soft heart. Rabbi Akiva proceeded to attend Torah classes with his young son, and he learned day in and day out, until he learned the entirety of Torah.<sup>70</sup> According to the Gaon of Vilna, this story teaches the power of accumulated knowledge. Even if a person learns only a drop of Torah, if he maintains consistency in his learning, it will add up to a large amount.<sup>71</sup> The Talmud in tractate Bava Batra 9b anticipated this comment of the Vilna Gaon, where it says that each and every *perutah* (small coin), eventually adds up to a large amount of tzedakah.<sup>72</sup> If a person wants to achieve greatness in Torah learning, it is essential to maintain a consistent and committed learning regiment.<sup>73</sup>

The second key factor in retaining one's Torah learning is developing an effective strategy. Rabbi Avraham Goldhar, the founder of the Daf Yomi memory program Zichru, gives an excellent analogy that illustrates the importance of strategy.<sup>74</sup> Imagine a person is asked how many baseballs he can hold in his two hands. He would probably say he can hold around 6 or 7 baseballs. But, what if someone said that he can hold 30 baseballs in his two hands-- how would that be possible? Rabbi Goldhar suggests that this would in fact be quite easy, if he were holding

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<sup>70</sup> Avot D'Rabbi Natan 6:2

<sup>71</sup> This teaching of Rabbi Elijah of Vilna is cited in Rabbi Rietti's One Minute Masmid, location 378

<sup>72</sup> Bava Batra 9b

<sup>73</sup> See also Midrash Vayira Rabbah 19:2 on the importance of commitment and consistency

<sup>74</sup> Zichru is a memory program for Daf Yomi that uses various memory techniques to help participants retain their learning, as will be discussed further.

a big bag into which he can throw as many baseballs as he wanted.<sup>75</sup> This analogy teaches that by creating an appropriate vessel in which to store one's Torah knowledge, one can be exponentially more effective in his learning. Strategic approaches to memory can be used to achieve the greatest levels of success in Torah learning.

### ***Memory Tactics and Classroom Practice***

We now come to the development of specific memory tactics. This section requires a brief introduction to the manner in which memory works. There are three steps to remembering information: encoding, storage, and retrieval. Encoding is the initial process of learning, during which the mind absorbs information. Encoding can occur in a wide variety of ways, the most effective of which will be discussed shortly. The information is then stored in the brain, through what are called memory traces or engrams, which are small wrinkles in the brain that represent the new information. The final step is retrieval, which is perhaps the most important step of the memory process. Retrieval is the act of recalling information. Humans can store large quantities of information in their brains, but only a small portion of that information is accessible; retrieval reinforces memory and thereby increases the amount of information accessible to a person. These three steps of encoding, storage, and retrieval are the foundation of memory.<sup>76</sup>

It is also important to understand the two basic types of memory: short term memory and long term memory. Short term memory stores information for a short period of time and it has a limited capacity. It allows a person to recall events and information that he experienced very recently. Information stored in short term memory can then be transferred to long term memory, if it is encoded properly. Long term memory holds information for long periods of time and it

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<sup>75</sup> Rabbi Avraham Golhar, Zichru Coaching Session: Day 1 (Masekhet Pesahim), *zichru.org*

<sup>76</sup> Kathleen B. McDermott and Henry L. Roediger III, *Memory (Encoding, Storage, Retrieval)*

has an unlimited capacity. Long term memory can be accessed in two ways, explicitly or implicitly. Explicit memory is the active recall and retrieval of information, such as facts or events, and implicit memory is the subconscious recall of information, such as abilities or skills.<sup>77</sup> This basic overview of memory will set the stage for our study of memory techniques.

The area of mnemonics and memory devices is very expansive, so we will focus on three specific areas of memory techniques. The first strategy to be explored is mnemonics, specifically the concept of memory palaces. The Talmud in tractate Shabbat (104a) recommends, “Make *simanim* for Torah, and you will acquire it,”<sup>78</sup> and the Talmud in tractate on Eruvin (54b) asserts, “Torah is only acquired through *simanim*.”<sup>79</sup> *Simanim* are mnemonic devices that the Tannaim and Amoraim used to remember their learning. The Talmud in tractate Eruvin (53a) explains that the Judean scholars were successful in their learning because they used precise language and created *simanim*. The Galilean scholars were not as successful, because they did not use precise language or create *simanim*.<sup>80</sup> These types of *simanim*, or mnemonics, can be found throughout the Talmud, often in the form of acronyms. For instance, the Talmud in tractate Hullin (11a) inquires about the source of a certain ruling, and before presenting the various approaches it gives a *siman*, “*zman shevakh mekannesh*” (lit. time collects that which is good), meaning that time has not caused forgetfulness. The *siman* is made up of letters taken from the names of the Rabbis who give answers to the question, and it is meant to help the reader remember the various opinions.<sup>81</sup> Another example is found in tractate Sanhedrin (57a) where the Talmud introduces a section of text with the *siman geshher*. The hebrew letters that make up the word *gesher* (*gimmel*,

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<sup>77</sup> Eduardo Camina and Francisco Güell, *The Neuroanatomical, Neurophysiological and Psychological Basis of Memory: Current Models and Their Origins*

<sup>78</sup> Shabbat 104a

<sup>79</sup> Eruvin 54b

<sup>80</sup> Eruvin 53a

<sup>81</sup> Crawford Howell Toy and Jacob Zallel Lauterbach, *Mnemonics (Jewish Encyclopedia)*

*shin, and reish*) denote the three sins that will be discussed: *giluy arayot* (illicit sexual relations), *shefikhut damim* (murder), and *birkhat haShem* (cursing G-d). The *siman* acts as a memory aid for the upcoming discussion in the Talmud.

The Ben Yehoyada commentary, authored by R. Joseph Hayyim b. Elijah of Baghdad (d. 1909) to tractate Eruvin (54b) points out that the first Mishnah in Avot (1:1) uses unusual language when it says that Moshe received the Torah *m'Sinai*, from Sinai, rather than *b'Sinai*, at Sinai.<sup>82</sup> This commentary explains that if the Hebrew letters of the word *m'Sinai* are rearranged, the word *siman* is spelled out, which teaches that the Torah was given to Moshe through *simanim*. Mnemonic devices are commonly used by the Talmud, because they allow for effective memorization, and thereby the acquisition of Torah knowledge.

The use of mnemonic devices dates back to the ancient world. The *Rhetorica Ad Herennium* is a book that instructs speakers in proper oratory skills, one of which is memory. Its author<sup>83</sup> writes that like all other disciplines, memory requires training. He claims that a person can train his mind to more effectively remember information by using memory palaces, and he introduces and outlines the concept of a memory palace. He says that the first step towards creating a memory palace is to choose a place with which one is very familiar, and one that does not have many people or other distractions in it. Next, one identifies items that represent the information that he would like to remember. He then places those items in various locations along his chosen place.<sup>84</sup> For instance, as noted above, it was said that the memory master

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<sup>82</sup> Avot 1:1

<sup>83</sup> Cicero, one of the greatest orators in Ancient Rome, is the likely author of the *Rhetorica Ad Herennium*. It was written between 86-82 BCE, according to Foer's *Moonwalking with Einstein*.

<sup>84</sup> Cicero, *Rhetorica Ad Herennium*, 63-67

Luria's S was able to remember hundreds of images by mentally walking down a road in his neighborhood and seeing all the items that he mentally placed along the path.<sup>85</sup>

Foer applies the memory palace to the common activity of writing a to-do list. We will explore his sample memory palace, including the specific techniques that he employs in its creation. For this example, we will take someone who has to: go to the store to buy pickled garlic, cottage cheese, and socks, and send an email to his friend Sophia. To build the memory palace, first, the person should think about his childhood home and imagine it in all of its details; this will be the setting for the memory palace. Next, he should take the items on the to-do list and place them around the house, one by one. To begin, he should imagine a jar of strong smelling pickled garlic sitting on the edge of the driveway. The reason for the emphasis on the strong smell is as Grandmaster of Memory Kevin Horsley explains in his book, *Unlimited Memory*, that when the five senses are invoked, one is much more likely to remember the image.<sup>86</sup> Next, he should picture a giant tub of cottage cheese with a person bathing in it. This is because the author of the Rhetorica Ad Herennium explains that extraordinary, shocking, and laughable images are quite effective.<sup>87</sup> Then, one should find a lamp in his house, and hang the pairs of socks from the lampshade, as it is similarly a strange and memorable image. Finally, he should imagine a person named Sophia sitting on someone's lap at a desk in the house, typing on the computer. One should choose either a Sophia whom he knows, or a famous person named Sophia, in order to best remember the person in the image.<sup>88</sup> The busy person with his to-do list has now developed a memory palace that he can use to recall his agenda for the day. Memory palaces encode information in a manner which transfers the information to long term memory and makes it

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<sup>85</sup> Carruthers, 94

<sup>86</sup> Kevin Horsley, *Unlimited Memory*, 47-48

<sup>87</sup> Cicero, 66

<sup>88</sup> Foer, 97-103

easily accessible in one's mind. The items on a to-do list, or any other information that one wishes to remember, becomes clearly organized and easily accessible through the use of a memory palace.

There is an abundance of research behind the concept of memory palaces. Studies have repeatedly shown that the human mind has a knack for remembering images. In a study done in the 1970's, subjects were shown one thousand images and were then asked if they could recall those images. The subjects did not think that they could recall them, but when they were shown slides that featured two pictures, one picture that they have seen before and one that they have not seen before, they were able to recall which one they have seen before for nearly all of the images. Even when the two images differed only in a small detail, for instance a stack of one dollar bills and a stack of five dollar bills, they were able to identify which they had seen before for over ninety percent of the images.<sup>89</sup> Although the notion of having a 'photographic memory' may be just a myth, it does appear that there are some people with a unique ability to capture information in their minds, but this is extremely rare. However, even people with average minds can use memory techniques that invoke mental images, to make it as if they have a kind of photographic memory. A study done by Elizabeth Valentine and John Wilding, found that USA Memory Champions have similar brain structures and intelligence levels to the average person. But, when they were given memory tasks to perform under the MRI scanner, it showed that they were using a completely different part of the brain to remember the information. The memory champions were converting the information into images in their minds.<sup>90</sup> This is because the human brain has an exceptional capacity for remembering pictures, and these memory experts had figured out how to most effectively use their minds for this purpose.

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<sup>89</sup> Foer, 25

<sup>90</sup> Elizabeth Valentine and John Wilding, *Essays in Cognitive Psychology: Superior Memory*



This technique of creating memory palaces has also been applied to Torah study. There is a legend that there were groups of modern-day Torah scholars who can pass the ‘pin test.’ The ‘pin test’ signifies that if someone puts a pin through a volume of the Talmud, the person with an exceptional memory can report every word on each page that the pin goes through. As psychologist George Stratton reported in 1982, the Shass Pollack group, a group of Polish Torah scholars, could identify where each word on the page was for twelve full tractates of the Talmud.<sup>9192</sup>

But, it is not only Torah giants who have accomplished such feats of memory. More recently, a memory program was created for Daf Yomi learners, those who study one folio page, or daf, of the Talmud each day, that has allowed people of average abilities to remember and recall hundreds of talmudic folios worth of information. It uses memory palaces to effectively encode the material into the learners’ minds. With the start of the most recent Daf Yomi cycle in January 2020, a new memory program called Zichru was launched. Zichru was founded by Rabbi Avraham Goldhar, a noted memory expert, along with Barry Lebovits, an acclaimed Daf Yomi teacher. Each day, they identify three main points of the daf and bridge them together in a mental image, which is tied to the number of the daf. This mental image is called a *siman*, named for the *simanim* used by the Tannaim and Amoraim. Zichru is presented as an audio shiur that is about twenty minutes in length. Rabbi Goldhar goes through the three main points and describes the *siman* for the daf; he then reviews the *simanim* for the past four folios and ends with a ‘pop quiz’ of ten questions, which allows the listener to mentally recall the main points from the past number of days.<sup>93</sup>

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<sup>91</sup> Foer, 29

<sup>92</sup> It is not definite to what we can attribute their tremendous knowledge; it could just be that they had single minded focus and perseverance, but it is likely that they used some sort of memory tactics.

<sup>93</sup> *Zichru: About Us*, [zichru.org](http://zichru.org)

It is helpful to look at an example of a Zichru *siman* in order to better understand how it works. The *siman* provided for tractate Berakhot, folio-page 32, is a mad scientist in a lab who creates a golden calf that will sing his praises all day long; but when the golden calf comes to life and runs out the door, the mad scientist breaks down into tears. The scene seems quite strange but when it is broken down, it becomes quite clear and well-organized. The lab reminds the person that he is on folio-page 32 because the hebrew letter of that daf, *lamed-bet*, can be transliterated and read as *lab*. The golden calf teaches that Moshe Rabeinu prayed to Hashem to save the Jewish people after their sin. The singing of his praises alludes to the requirement that one praise Hashem before making requests during his *Shemoneh Esrei* prayer. The calf running out the door and the mad scientist breaking down into tears teach that the *Gates of Tears* are never locked, and crying out in prayer can always evoke a Divine response.<sup>94</sup>

This *siman* incorporates vivid imagery and a shocking scene to create an image that becomes imprinted in one's mind. Zichru has been creating *simanim* everyday since the start of the most recent Daf Yomi cycle, and the results have been astonishing. Zichru has thousands of participants, who to date, have covered over eighteen percent of the Talmud with these *simanim*. This means that in the folio-pages that have been learned, there are significant foci of the talmudic discussion that are readily available for mental recall. This is no longer the legend of learned Jews who can pass the 'pin test.' Through the use of memory palaces, even regular students of the Daf Yomi can learn to train their memories to retain massive amounts of Torah knowledge.

The strategy of using mental images can also be used in the classroom to help students effectively remember and recall the information that they learn in class. It has been shown in

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<sup>94</sup> Zichru Berakhot 32, [zichru.org](http://zichru.org)

classroom education that non-linguistic representations are effective in helping students learn and remember information. Non-linguistic representations can include any visual or sensory aids, including vivid imagery, physical models, and drawing. There are many ways to incorporate non-linguistic representations into the classroom. Studies have shown that when teachers use images to relay information, students are able to process and recall the information much more effectively.<sup>95</sup> Medina (2008) writes, “They tap into the students’ natural tendency for visual image processing, which helps them construct meaning of relevant content and skills and have a better capacity to remember it later.”<sup>96</sup> When information is converted into images, it helps students better process, organize, and retrieve information. It is effective for teachers to give students the opportunity to draw their own images as well, as it aids in processing the information being presented. Non-linguistic representations are a powerful classroom tool that can be used to help students better process, remember, and recall information that they learn.

A second memory tactic noted by Chazal is learning with one’s entire body. The Talmud in tractate Eruvin (53b-54a) relates the story of Bruriah, the wife of the Tanna R. Meir who was an impressive Torah scholar in her own right. Bruriah saw a young scholar learning quietly in the beit midrash and she struck him saying, “If you learn with all your 365 limbs, the Torah will become guarded within your being, and if not, it will not be guarded!”<sup>97</sup> Bruriah insisted that the young scholar verbalize his learning so that he could better internalize and remember it. In his comment on Talmud Yerushalmi tractate Shekalim (13b), the Tiklin Chadtin says that we will only merit true comprehension if we study Torah out loud with our mouths.<sup>98</sup> The practice of

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<sup>95</sup> Jewitt, 2008; Kress, 1997; these studies, along with a number of the others cited in this paper, were found in the collection *Classroom Instruction That Works*.

<sup>96</sup> Medina, 2008

<sup>97</sup> Eruvin 53a-54b

<sup>98</sup> Tiklin Chadtin on Shekalim 13b, s.v. *ein lanu peh le’echol*

verbalizing one's learning is actually codified in halachic works. Rambam in Hilkhot Talmud Torah writes that one who learns out loud will be successful, but one who learns quietly will quickly forget.<sup>99</sup> Shulchan Arukh echoes that one who learns quietly will forget his learning, but one who verbalizes his learning will remember it.<sup>100</sup> The act of verbalization aids in understanding and retaining one's learning.

Bruriah's advice to the young Torah scholar reflects the educational concept of kinesthetic learning. Kinesthetic learning is the act of engaging the students in full body activities such as acting out scenes, engaging in physical movements, and creating sounds that correspond to information being learned.<sup>101</sup> Studies show that engaging in physical activities creates neural networks that have been proven to remain in the students' minds and memories for longer periods of time.<sup>102</sup> Encoding information through associations with movement and physical activity is effective, because the students will associate the learning experience with the material learned, which makes the information more memorable.<sup>103</sup> When teachers give students opportunities to engage their bodies in learning, the students are able to process and remember the information at a higher level. Kinesthetic learning can be used for a wide gamut of subject matters and ages. Following an educational activity that involves kinesthetic learning, students should be instructed to reflect both on the information they learned, as well as how the experience of kinesthetic learning impacted their learning.<sup>104</sup> By allowing the students to reflect on their experience of kinesthetic learning, they will better understand and appreciate the process of learning and remembering.

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<sup>99</sup> Rambam Hilkhot Talmud Torah 3:12

<sup>100</sup> Shulchan Aruch, Yoreh De'ah 246:22

<sup>101</sup> *Classroom Instruction that Works*, 73

<sup>102</sup> Jensen, 2001

<sup>103</sup> Kathleen B. McDermott and Henry L. Roediger III

<sup>104</sup> *Classroom Instruction that Works*, 74

According to Kuczala and Lengel, authors of *The Kinesthetic Classroom*, kinesthetic learning has been shown to be highly effective in many areas of learning, including increasing student motivation, engagement, learning, and retention of information.<sup>105</sup> We will briefly look at how kinesthetic learning impacts each of these areas. Firstly, it is important for teachers to practice differentiation in order to engage the entire range of students in the classroom. Research shows that over 85% of children prefer kinesthetic learning to standard classroom learning, which means that kinesthetic learning activities will motivate and engage a larger group of students than would regular classroom learning.<sup>106</sup> Additionally, kinesthetic learning allows for increased focus and comprehension during learning. The brain and the body are intrinsically connected; in fact, the right and left hemispheres of the brain are interdependent, and they work better together.<sup>107</sup> Engaging the students in movements before class such as cross lateral movements with the body such as toe tapping and clapping in different directions, connects the two hemispheres, which allows for increased focus and comprehension in the classroom.<sup>108</sup>

Finally, kinesthetic learning is effective in improving retention and recall of information. In Marilee Springer's book, *Learning and Memory: The Brain in Action*, she outlines five different types of memories: semantic, episodic, emotional, automatic, and procedural. Based on these categories of memory, Kuczala and Lengel offer two reasons why physical movement improves memory. One reason is that actions and movement are processed as procedural memory, which has shown to be much more memorable than semantic memory.<sup>109</sup> Another reason is that students will often have positive associations with kinesthetic learning activities,

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<sup>105</sup> Kuczala and Lengel, *The Kinesthetic Classroom*, 14-15

<sup>106</sup> Kuczala and Lengel, 28

<sup>107</sup> *ibid.*, 20

<sup>108</sup> Dennison & Dennison, 1998, Hannaford, 1995, and Promislow, 1999; as cited in Kuczala and Lengel's *The Kinesthetic Classroom*, 5

<sup>109</sup> Kuczala and Lengel, 17-18, 29

and that experience will transfer the information to the emotional memory, which is the strongest of all the memories.<sup>110</sup> Kinesthetic learning offers tremendous benefits in student engagement, learning, and retention. As Kuczala and Lengel write, “It is believed that the way we think, learn, and remember, can be influenced by the physical movements in which we participate.”<sup>111</sup>

The last memory tactic that we will explore is consistent and spaced review. The Talmud in tractate Eruvin (54a) says that if one wants to be successful in Torah study, he should liken himself to an animal that catches its prey and eats it immediately.<sup>112</sup> Rabbi Adin Steinsaltz (Israel, d. 2020) explains that this means a person should review his learning immediately after he learns it for the first time.<sup>113</sup> A subsequent passage in tractate Eruvin (54b) compares a Torah scholar to a hunter. Just as a hunter breaks the wings of each bird he catches so that it will not be able to fly away, so too a Torah scholar must review each lesson after he learns it to ensure that he will retain it.<sup>114</sup> These two talmudic passages demonstrate the importance of reviewing immediately after learning. The second step in the process of review is a spaced system of review. The Talmud in tractate Pesachim (68b) notes that R’ Sheshet would review his learning every 30 days.<sup>115</sup> The Talmud in tractate Berakhot (38b) remarks that Rabbi Chiya was greater than Rabbi Binyamin bar Yefet because he would review his learning every 30 days in front of his teacher Rabbi Yochanan; as such, Rabbi Binyamin bar Yefet is not even able to challenge Rabbi Chiya.<sup>116</sup> The Tosafot glosses to that talmudic passage explain that each month, Rabbi

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<sup>110</sup> Ibid., 18

<sup>111</sup> Ratey, 2008; as cited as quoted in Kuczala and Lengel’s *The Kinesthetic Classroom*, 5

<sup>112</sup> Eruvin 54a

<sup>113</sup> Steinsaltz on Eruvin 54a

<sup>114</sup> Eruvin 54b

<sup>115</sup> Pesachim 68b

<sup>116</sup> Berakhot 38b

Chiya would review what he had learned in the past thirty days.<sup>117</sup> R. Yom Tov Ishvilli (Ritva, d. 1325 in Spain) points out that by reviewing in front of Rabbi Yochanan, Rabbi Chiya was able to ensure that he understood the material correctly. This thirty-day review regiment was used by many Torah scholars, and was found to be very effective.<sup>118</sup>

Indeed, spaced review and recall of information has been found to be very effective in all types of education. In the classroom, teachers should begin with massed practice and review, and then move over to more distributed practice sessions as the students become more competent in the information and skills being learned. Studies show that short and frequent practice sessions that are spread over time are the most successful. Similar to Rabbi Chiya's review in the presence of his teacher Rabbi Yochanan, studies have also shown that before moving on to new information in other educational settings, teachers should check the level of their students' understanding, to ensure that the students have a strong grasp of the material.<sup>119</sup> Carpenter, Pashler, & Cepeda (2009) add that students should not only be given the opportunity to review along intervals of time, but they should be tested on their knowledge. The act of recalling information has been shown to improve student achievement remarkably.<sup>120</sup> In order to most effectively help students retain information, they should be given opportunities to practice immediately after learning, and then to review and recall information at later intervals of time.

Large amounts of information are stored in the long term memory, but most of it is inaccessible because it is not retrieved. Retrieval strengthens the memory and raises the likelihood that the information will be able to be recalled again in the future.<sup>121</sup> Teachers and

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<sup>117</sup> Tosafot on Berakhot 38b s.v. *kol tlatin yomin mehader talmudei*; these Tosafot were produced in northern France c. 1250. See E. E. Urbach, *Ba'alei ha-Tosafot* (Jerusalem, 1984), 2:600-01.

<sup>118</sup> See Ketubot 77b for a more mystical anecdote about 30 day review

<sup>119</sup> *Classroom Instruction that Works*, 111-112

<sup>120</sup> Carpenter, Pashler, & Cepeda, 2009

<sup>121</sup> Kathleen B. McDermott and Henry L. Roediger III

students alike do not often recognize the value in using recall as a learning strategy. In a study of 177 students at Washington University in St. Louis, the students were asked about their top study strategies. The study techniques reported were then grouped into 11 overall strategies including rereading the textbook or notes, self-testing, using flashcards, writing outlines, highlighting, and studying with a group. When asked for their top strategy, 97 students responded that they most often reread the textbook or their notes, while only two students responded that they utilized recall and self testing. The overwhelming majority of students prefer to read over the information rather than to attempt to recall. However, rereading notes is not as effective a study strategy because it gives the learner the illusion that he or she knows the material, but if subsequently the student were asked questions on the material, it is unlikely that the student would be able to answer.<sup>122</sup> The process of recall, on the other hand, strengthens the student's mastery of the material as it forces the student to reach into his or her knowledge and withdraw the information. Although the method of retrieval demands more of the student than does rereading the textbook or notes, it has proven to take the same amount of time and achieve greater results.<sup>123</sup> Teachers should teach their students the learning benefits of recalling information in order that they can develop effective study strategies.

There are a number of ways that recall can be used in the classroom. There is a strategy that has been coined as *retrieval practice*, which forces students to recall information they have learned. Retrieval practice gives the students various opportunities to recall information that they have learned. For example, students can be given a bell-work activity to write down three things they remember from last class, or they can be given a pop quiz to recall what they have learned over the past week. Retrieval practice allows students to dig deep into their memories to recall

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<sup>122</sup> Karpicke, 2009

<sup>123</sup> Gonzalez, 2019



information, which has been shown to significantly improve retention. In fact, studies show that forgetting information and relearning it within a short period of time actually further improves retention.<sup>124</sup> Retrieval practice assignments should be done for little or no stakes, as they should be used as a learning strategy rather than a testing method. Additionally, corrective feedback should be given after retrieval practice assignments, to make sure that students clearly understand the concepts being learned.<sup>125</sup> Recalling information through retrieval practice should be used consistently throughout the school year as a method of enhancing student learning and retention.

### ***Conclusion***

We have explored the tremendous value that has been placed on memory, from the medieval societies which were formed on the basis of memory to the Talmudic scholars who emphasize the centrality of memory in Torah learning. Chazal teaches that remembering one's learning leads a person to amass Torah knowledge, as well as to better his love and service of Hashem, both of which are essential in leading lives as Jews. Of the many strategic approaches to memory enumerated by Chazal, we have discussed *simanim*, verbalization, and consistent review, as well as their applications in modern-day education.

There is a Midrash found in tractate Niddah (30b) that demonstrates a key finding of our study. The Midrash teaches that a baby is taught the entirety of Torah in its mother's womb, but when the baby is born, an angel strikes its mouth and it forgets all of the Torah.<sup>126</sup> This Midrash illustrates that each and every person has a great capacity to learn Torah; in fact, there was a

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<sup>124</sup> Ibid.

<sup>125</sup> Ibid.

<sup>126</sup> Niddah 30b

point when we all knew the entirety of Torah. Our study has shown that the human mind is capable of achieving great heights in memory, if we take a strategic approach towards it. The capacities of our own minds and the minds of our students is endless, and we can use these memory strategies to build immense Torah knowledge and to reach our fullest potentials in the service of Hashem.

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