Anecdotal stories are great to read but I like to make decisions on data. I haven’t seen much data when it comes to which system is better for memorizing numbers and I needed to do better at house numbers and phone numbers. So here is my analysis on systems that memorize digits for competition and casual users like me. Please feel free to suggest improvements or other systems.

# Competition systems analysis for numbers

## Summary

The **3-digit story** **system is best** for competition if several years of practice are put in. A similar 4-digit system has little added benefit and practice becomes burdensome. A similar 2-digit system is best for casual users producing faster results than any peg system.

## The winning system

The 3-digit improvisational story system starts with an encoding system to map digits to word sounds. Popular encodings from digit to word sounds are the Major and the Ben systems (@Ben = Ben Pridmore). Mappings to other data types can be made for 2-digit systems but don’t have the flexibility that sounds give. The word sounds are then visualized as a memory image.

The Ben system has the added benefit for memory competition of reuse for binary numbers and playing cards because of the 16 different consonant sounds. The Major system can be extended into 13 consonant sounds easily for playing cards and 16 takes a little more effort.

## The analysis method

Each system was broken down into two main process categories of preparation and visualization. The competition environment uses simple data types that need no strategies or familiarization except in the case of people’s names where practicing with common names helps. Each process defines a quantifiable amount of mental work as either encodings or associations.

**Preparation workload** involves the development or acquiring and practice of a memory system. The metric used here is the number of visual sentence component pegs (P, A, O, L) to be prepared for the system (CPs). This is the number of digits used in the system multiplied by the number of component peg values needed. Visual sentence component pegs directly relate to the amount of time needed to become proficient through practice and a conversion of one PC per day is used for casual users and is meant for comparison purposes only. The more practice that competitors put in will reduce the time needed to master the system. A lower number is better.

**Visualization workload** is measured by the units of how many associations are made per memory image so that it can be used with another memory image. I assumed that most system users were fluent in encoding digits to sounds and that what mattered was the association of sounds to memory image rather than having any issue with decreased efficiency due to being unable to encode. Each sound association maps a digit or digits to a visualized memory image.

A complex memory image, or visual sentence, is created by adding enhancing details so that it becomes more memorable. Those data type details can include subject, subject enhancements, strong action verb, direct object or items, and location or terrain (SEA-IT). A visual sentence can be described as connected set of those details such as a subject-verb-object in a location. This is a direct relationship with the PAO (Person-Action-Object) system which has been improved by adding a location (PAIL).

The metrics used for measurement per memory image were

1. how many image components were recalled (**MI components**)
2. how many associations were made in the creation of the visual sentence, usually one less than the MI components (**sentence links**) and
3. how many associations need to be made to store the memory image with the backing traversal order in the memory system (**system links**).

Because the mind can store seven plus or minus two items at a time easily in working memory, the Miller number, a goal of seven or less is desired for visualization workload.

That number is then divided by the number of digits being encoded to get a KPI (key performance indicator) for system visualization efficiency (SVE). The lower the score the better. The other KPI of visual sentence component pegs (CPs) should make systems easily comparable for either casual or competitive users.

## Systems analyzed

Systems and other terms are described by names defined in my **Memory systems summary** and **Glossary of memory terms** found at [my Github repo for memory](https://github.com/doughoff/Memory).

|  |  |  |
| --- | --- | --- |
| Digits | System type combined with number pegs | Abbreviation |
| 1 | Story improvisation of any data type | 1-\* |
| 1 | Story improvisation – PA, PO, or OP/AL | 1-PA |
| 1 | Adventure or marked path PAO | 1-PAO |
| 1 | Adventure or marked path PAIL | 1-PAIL |
| 2 | Story improvisation of any data type | 2-\* |
| 2 | Story improvisation – PA, PO, or OP/AL | 2-PA |
| 2 | Adventure or marked path PAO | 2-PAO |
| 2 | Adventure or marked path PAIL | 2-PAIL |
| 3 | Story improvisation of any data type | 3-\* |
| 3 | Story improvisation – PA, PO, or OP/AL | 3-PA |
| 3 | Adventure or marked path PAO | 3-PAO |
| 3 | Adventure or marked path PAIL | 3-PAIL |
| 4 | Story improvisation of any data type | 4-\* |

**Notes**: OP/AL is my enhanced Person-Action, PAIL is Person-Action-Item-Location, adventure and marked path are both types of a method of loci.

## The results

### Preparation workload

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| System | system peg values | peg images combined | CP Total | App. time to master |
| 1-\* | 10 | 1 | 10 | 1w |
| 1-PA | 10 | 2 | 20 | 3w |
| 1-PAO | 10 | 3 | 30 | 1m |
| 1-PAIL | 10 | 4 | 40 | 1m1w |
| 2-\* | 100 | 1 | 100 | 3w |
| 2-PA | 100 | 2 | 200 | 6m |
| 2-PAO | 100 | 3 | 300 | 10m |
| 2-PAIL | 100 | 4 | 400 | 1y |
| 3-\* | 1000 | 1 | 1000 | 3y |
| 3-PA | 1000 | 2 | 2000 | 5y |
| 3-PAO | 1000 | 3 | 3000 | 8y |
| 3-PAIL | 1000 | 4 | 4000 | 11y |
| 4-\* | 10,000 | 1 | 10,000 | 28y |

### Visualization workload

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| System | Memory image components | Sentence component assoc. | System image assoc. | Total (7 ± 2 optimum) | Chunks | System visualization efficiency (SVE) |
| 1-\* | 1 | 0 | 1 | 2 | 1 | 2 |
| 1-PA | 2 | 1 | 1 | 4 | 1 | 4 |
| 1-PAO | 3 | 2 | 2 | 7 | 1 | 7 |
| 1-PAIL | 4 | 3 | 2 | 9 | 1 | 9 |
| 2-\* | 1 | 0 | 1 | 2 | 2 | 1 |
| 2-PA | 2 | 1 | 1 | 4 | 2 | 2 |
| 2-PAO | 3 | 2 | 2 | 7 | 2 | 3.5 |
| 2-PAIL | 4 | 3 | 2 | 9 | 2 | 4.5 |
| 3-\* | 1 | 0 | 1 | 2 | 3 | 0.7 |
| 3-PA | 2 | 1 | 1 | 4 | 3 | 1.3 |
| 3-PAO | 3 | 2 | 2 | 7 | 3 | 2.3 |
| 3-PAIL | 4 | 3 | 2 | 9 | 3 | 3 |
| 4-\* | 1 | 0 | 1 | 2 | 4 | 0.5 |

## Discussion

In general, the systems using a narrative system had a greater efficiency seen by the smaller SVE but topped out at three digits for significant incremental gains. The preparation workload between three- and four-digit narrative systems was greatly increased.

@katiek (Katie Kermode) switched from a modified 3-PAO (SVE=2.3) system to a 3-\* (SVE=0.7) type system at the direction of @lociinthesky (Lance Tschirhart) and increased her speed after eight years of using the 3-PAO system in only two months.

I think that the placement of the optimum number memory images in the same location in a method of loci background, is a matter of the Miller number. In other words, the mental workload decreases if you place two rather than three memory images per location. @AlexM (Alex Mullen) switched from three to two memory images and believes that the change was responsible for a spike in his scores. I don’t know his number system but any decrease in visualization workload towards a goal of five to seven will get you the best results.

The 3-digit improvisational story visualizationseems to be best for competition if several years of practice are put in which most competitors do. A similar 4-digit system has little added benefit and the practice of it becomes burdensome. Most people want to develop a competition weight system quickly. A similar 2-digit system is best for casual users producing faster results than any peg system.

One thing I’ve found that helps in developing a narrative traversal approach is for the memory images to contain significant enhancing details with a visual sentence structure using subject, subject enhancements, strong action verb, direct object or items, and location or terrain (SEA-IT). The ability to tie a new image to the last is increased by the details that you can build relevant associations to.

Competitors with an already strong reusable method of loci system have no benefit over forming visual sentences and this would be a personal choice. Casual users do best with less complexity and therefore a story system with a narrative traversal is better to start with.