The Importance Of Cognitive Science For Actors

Cognitive science involves the study of internal mental processes—all of the things that go on inside your brain, including perception, thinking, memory, attention, language, problem-solving, and learning (Cherry, 2019).

Helga Noice, a professor of psychology at Elmhurst College in Illinois, spent more than 20 years investigating how actors learn their lines. What was surprising is that they did not learn their lines in the traditional sense. They appeared to just keep rehearsing until the lines stuck. Noice interviewed hundreds of actors, commenting on the methods they practiced, “Almost every line of the script is mined for clues as to the characters, situations, or relationships,” (Paul, 2012). The actors were looking for the intentions of the play’s characters: what links the actions and words together. The process of blocking on stage having a significant impact on the learning of lines.

Lastly, the emotions that actors attach to their characters and the words they use sear the words into their memories. They learned through deep processing, physical movement and emotional associations — but how is this supported in the scientific literature on memory?

What I want to explore is to first understand how the brain works with regards to memory. The next step would be to understand the different ways that we as humans learn, our ‘Style’ or ‘Type’ and if by utilising certain aspects of our learning type would it positively influence the effectiveness in the learning of lines as an actor.

Cognitive behaviour and the science of learning is so vast that it could not all be covered within this essay; however, I have documented areas that I believe add a balanced and clear view and salient points on this subject, from validated research journals.

Whilst studying acting, I have come across a plethora of techniques and personally found some more useful than others! Which raises the question “which techniques are best”? And is teaching a single method universally, detrimental to some actors?

Through my action research approach, I hope that this essay goes some way to show that there is indeed a preferred way for an actor to learn their lines based upon some basic best practices for everyone and then tailored for each person’s type of learning.

How Does our Memory Work?

Jensen (1998, p.39) states that ‘Meaning is more important to the brain than information’. Scientists are unsure how humans learn but they do understand the process of how we learn. Essentially, memory is a complex process that involves acquiring, storing, and recalling information. To form new memories, information must be changed into a usable form, which occurs through the process known as encoding. Once the information has been successfully encoded, it must be stored in memory for later use. Encoding is the first step in creating a memory. It is a biological phenomenon, rooted in the senses, that begins with perception. When you meet someone each of your separate senses; example visual, auditory, olfactory and touch,

sends information to your brain, specifically the hippocampus, which integrates these perceptions as they were occurring into one single experience. (Cherry, 2020)

Psychologists believe the main areas that affect memory in the brain are the hippocampus and the frontal cortex. These are responsible for analysing these various sensory inputs and deciding if they are worth remembering. Once deemed worthy they then may become part of your long-term memory. How these inputs are later identified and retrieved to form a cohesive memory is not yet known.

To properly encode a memory, you must first be paying attention. Since you cannot pay attention to everything all the time, most of what you encounter is simply filtered out, and only a few stimuli pass into your conscious awareness. According to Mohs (n.d.) ‘How you pay attention may be the most important factor in how much you remember’.

In the pathway diagram Jensen (1998a, p.60) illustrates how memory is recalled through pathways.

How Long Do Memories Last?

McLeod (2017) outlines the Stage Model of Memory theory proposed in 1968 by Atkinson and Shiffrin shows three separate stages of memory: sensory memory, short-term memory, and long-term memory. Sensory information from the environment is stored for a very brief period, generally for no longer than a half-second for visual information and 3 or 4 seconds for auditory information. Most of the information stored in short-term memory will be kept for approximately twenty to thirty seconds. Attending to this information allows it to continue to the next stage - long-term memory. Finally, some memories are capable of enduring much longer, from days to even decades. These long-term memories tend to lie outside of our immediate awareness but can be drawn into consciousness when they are needed. In Freudian psychology, long-term memory would be called the preconscious and unconscious.

The Organization of Memory

The ability to access and retrieve information from long-term memory is critical in learning lines. The specific way information is organized in long-term memory is not well understood, but researchers do know that these memories are arranged in groups or clustering. Clustering is used to organize related information into groups. Which is broken down into two groups Semantic Memory, refers to our memory of facts and information. Episodic Memory is our memory of specific actions or events we have encountered (Nyberg, 2008).

Information that is categorized becomes easier to remember and recall and can work best when the association is illogical and irrational. Additionally, an effective memorization technique draws on physical and emotional engagement. Whilst in rehearsal words are often intimately connected to actions onstage and replicating the action recalls the memory of the line/s.

Forgetting our lines is a common problem and much work has been done on memory loss, especially with regards to dementia patients, but this subject alone is sufficient to fill several pages and so I have not included it within this essay.

Improving Short to Long Term

It’s easy to assume that the more work you put into learning your lines, the better you will remember them. Yet taking the occasional downtime of just 10-15 minutes of quiet contemplation, between learning, could benefit your memory more than if you had continued to try to learn more. Robson (2018) states that ‘The remarkable memory-boosting benefits of undisturbed rest were first documented in 1900 by the German psychologist Georg Elias Muller and his student Alfons Pilzecker’.

In their experiments, participants given a break, between learning lists of information, remembered nearly 50% more than the group given no break time. The finding suggested that our memory is especially fragile just after it has first been encoded, making it more susceptible to interference from new information. This was once thought to happen primarily during sleep, with heightened communication between the hippocampus and the cortex, a process that may build and strengthen the new neural connections that are necessary for later recall.

Sleep activity is crucial in maintaining a healthy mind and can be affected negatively by a disruption to your circadian rhythm. Examining how we learn Mou (2016) suggests ‘The circadian clock could regulate learning and memory through hormonal signalling’. The circadian rhythm acts like a 24-hour internal clock that is running in the background of your brain and cycles between sleepiness and alertness at regular intervals. It's also known as your sleep/wake cycle. The hypothalamus controls your circadian rhythm. When it is dark at night, your eyes send a signal to the hypothalamus that it is time to feel tired. Your brain, in turn, sends a signal to your body to release melatonin, which makes your body tired. Your circadian rhythm works best when you have regular sleep habits, if it is disrupted, you may feel out of sorts and find it harder to pay attention.

Boosting Memory

No matter how great your memory is, there are probably a few things you can do to make it even better. Fortunately, cognitive psychologists have discovered several techniques that can help improve memory. Proven ways to protect memory include following a healthy diet, exercising regularly, not smoking, and keeping blood pressure, cholesterol, and blood sugar in check. Living a mentally active life is important, too. Just as muscles grow stronger with use, mental exercise helps keep mental skills and memory in tone. However, research has shown that there are some more peculiar things that one can do to improve memory retention and recall and these include; chewing gum, moving your eyes horizontally left and right, clenching fists, taking rests (even naps) between study sessions, not having a mobile phone near you whilst studying, practice good posture, and studying at a time that suits your circadian clock! I have compiled a list of activities that should improve memory retention and recall. See appendix 1.

Types of learning

People learn differently, utilising different learning styles and techniques. Some people may find that they have a dominant style of learning, whilst others may find that they use different styles in different circumstances.

Using multiple learning styles and multiple intelligences for learning is a relatively new approach. By recognizing and understanding your learning styles, you can use techniques better suited to you. This should improve the speed and quality of learning lines.

In the explanatory diagram an overview of learning styles Advanogy.com. (2004) shows the relationship between areas of the brain and the seven learning styles

The Seven Learning Styles

1. Visual (spatial): You prefer using pictures, images, and spatial understanding and these should be incorporated into the way you learn your lines.
2. Aural (auditory-musical): You prefer using sound and music. One could try adding, rhyme, or try singing your lines.
3. Verbal (linguistic): You prefer using words, both in speech and writing. Example, use recordings of your content for repetition learning of lines.
4. Physical (kinaesthetic): You prefer using your body, hands and sense of touch. Example, act out the emotions within the lines.
5. Logical (mathematical): You prefer using logic, reasoning and systems. Understanding more detail behind your lines such as researching the era.
6. Social (interpersonal): You prefer to learn in groups or with other people. To be effective you should work with others as much as possible, such as learning your lines as role play.
7. Solitary (intrapersonal): You prefer to work alone and use self-study. Spend more time setting clear goals, objectives and plans. Create a personal interest in your topic/s and or characters.

Research shows that each learning style uses different parts of the brain. By involving more of the brain during learning, we remember more of what we learn.

Application of Tests to Test Subjects

Initially, to evaluate how learning type impacted on the ability to retain and recall memory, I conducted several tests: four test subjects (acting students) were tested. The test subjects were chosen specifically based on their learning styles, two were visual learners and two were auditory learners.

The target was to test twenty test subjects, as promulgated by Nielson (2012) ‘Test at least 20 users to get statistically significant numbers’ however, I was unable to complete this ideal sample number of tests due to COVID-19.

Initially, two short term memory tests were conducted, where each test subject was tested to see how well they could remember a list of numbers immediately after being given them. Firstly, only six random numbers were given, then they were all given nine random numbers to remember. Following on from this test the Test Subjects were split into two groups each consisting of one visual learner and one auditory. Two planetary tests were devised – see Appendix 3. One visual and one auditory, only one of the tests was given to each group. The tests involved remembering the names of the planets within our solar system. None of the tests subjects already knew the correct order of the planets from the sun, but all were familiar with the

names of the planets.

A visual test was given to one group where pictures were used to identify the planets along with written words. The other test was conducted only verbally where the story was merely spoken with no pictures shown. A week later the Test Subjects were asked to recall the list of planets in order from the Sun.

The short-term memory test revealed that all the test subjects could remember the list of six random numbers but that everyone failed to remember the nine random numbers, indeed, surprisingly all the test failed to recall the first six numbers of the nine random numbers. Thereby giving credence to the summation that short term memory works best with units of between five to Seven as stated by Jacobson (2013).

The results from the planetary tests revealed that in the visual test the test subject with the visual learning style performed better than the test subject with auditory style and in the auditory test the test subject with the auditory style faired best.

It is plausible, based on the findings of the tests, that my premise of utilising cognitive science to help actors improve their ability to learn lines could indeed be valid.

Further Research

Because the numbers of test subjects were low, the conclusion does not have the veracity of a scientific assessment. Therefore, the testing of a greater number of test subjects would provide a more concrete conclusion. Also, further development be made if all seven learning styles were covered across all test subjects that were to be tested. In addition, the test would benefit from qualitative data, whereby a questionnaire would elicit feedback from the test subjects on how the test could be improved.

My test Personal Tests Based Upon Learning of Lines

To test the efficacy of cognitive science as an aid to learning lines I tested myself to initially learn two monologues, from Shakespeare's Henry IV and Szymkowicz's Where You Can't Follow, each roughly 1 minute 45 seconds duration. Using two methods. Following the results, of method one and two I undertook to learn a third monologue, a few days later, from Goldman's The Lion in Winter using the third method. see appendix 4.

Method One. The first monologue I chose was Falstaff's "Tis not due yet" from Shakespeare's Henry IV. I used my traditional approach to learning lines by recording myself saying the monologue and then replaying it back through headphones and stop starting as I repeated back the lines over a period of 40 minutes followed by reading the lines for thirty minutes followed once again by stop starting a recording. I repeated this for 2 hours a day.**Method Two.** For the second monologue, I chose Matt's "I guess I haven't done as well" from Szymkowicz's Where You Can't Follow. I experimented by putting in place what I had learned through my research: firstly I undertook the 'learning style questionnaire' and identified myself as both logical and visual in style with a balance of social and solitary preference. I then incorporated Noice's observations of actors namely that they learnt through; deep processing, physical movement and emotional associations. I also ensured that I applied at least the 'must

do’ best practice solutions incorporating Chew Uniting Rest Eat Sleep Time Type (CURESTT) mainly; chewing a piece of gum whilst studying, breaking up the words into units of no more than seven, studying for twenty minutes then taking a rest of ten minutes (quiet time with no distractions or music) and repeating for the full two hour study session, eating a balanced diet during the week, studying two hours before bedtime and ensuring that my circadian clock was not compromised, whilst ensuring that I followed the best practice for my ‘type’ of learning.

For all three monologues, the results were recorded the following morning as follows; I would try and recall as much of the monologue noting down how well I had performed. This included how fluid was the recall, the number of prompts I needed and the modal average length of lines I could recall before a prompt was needed. I continued this approach for three days.

Method Three. For the third monologue Henry II’s “My life when it is written” from Goldman’s The Lion in Winter I combined both method one and two.**The results:** method one versus method two was 25% less effective over the first day of lines being accurately recalled and needed 10% more prompts. However, on day two of measured recall, method one achieved a 20% greater recall of lines learned and needed less prompts albeit with several pauses between lines. An interesting observation through the recall sessions was method two recall was always fluid in remembering the information learned either there was an immediate recall or there was none. Both method one and method two had 90% recall of the leaned lines by the third day. Method three did produce the best results in all areas being evaluated for every day, with the entire monologue learned in full with no prompts or errors by the third day.

Conclusion

There is clear scientific evidence of practices that show ways in which an actor can improve retention and recall of memory. Also, through the action research, there is reasonable evidence to suggest a level of credence to the hypothesis that cognitive science can indeed help an actor improve the effectiveness of learning their lines. The evidence relating to different types of learning and their impact on memory, was inconclusive, partly due to the lack of a significant test sample of test subjects, which also resulted in a low level of quantitative and qualitative data. However, on a personal level, there was a marked improvement in learning of lines of a monologue. This was evidenced by applying techniques for my learning style, as discovered using the excel questionnaire, and following ‘must do’ memory improvement performance practices. The results that were gleaned would suggest that this approach is worth further examination and scrutiny. This might be done using a wider range of test subjects, covering most if not all the learning styles, and utilising a feedback survey to obtain qualitative data as well as the quantitative data.