APPLYING THINKING

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OVERVIEW

This is a foundational guide for the **individual** who is deliberately bettering the development of their mind: cognitively, emotionally, meaningfully.

My primary objective here is to supply the agentic learner with **building blocks** able to be creatively assembled, which in turn may generate and refine practical techniques to fit the specific lifestyle and problems most relevant to them.

BASIS: Memory & Knowledge

Memory Types:

- *Short-Term*/Working Memory: temporary, manipulable storage that can only hold about 7 conceptual objects [1]; also highly related to fluid intelligence [2]
- Long-Term Memory: storage of thoughts over a long period of time
  - Episodic Memory: temporal as if replaying a bit of film [3]
  - Semantic Memory: fact-based, generally static and non-sensory information
  - Procedural/Implicit Memory: actionable behaviours
- Properties: elements that may add to any of the above memory types

- ➢ Sensory: visual, auditory, gustatory, olfactory, haptic
- ➢ Prospective: memories for future actions

Memories are typically categorised as *short-term* or long-term. Conceptually, episodic memories can be transformed into semantic or procedural memories but not the other way round.

Example Distinctions:

- ➢ Remembering someone's name after just meeting them for reference
- ➢ Recalling a historical fact related to a building one is currently in
- ➢ Updating a friend about what you did this morning
- ➢ Riding a bike after five years of not riding one
- ➢ Recalling a childhood memory about a mother's home-cooked meal (L-T: E+S)

By distinguishing the type of memory, such as the childhood memory above as L-T: E+S (Long-Term: Episodic+Sensory), there exists clearer parameters for improvement – visualising details of past actions, intensifying vividness of sensory stimuli and retaining the memory for several decades more.

Memory Techniques [4]**:**

1. Encoding:
   - ☐ Chunking: grouping several simple semantic ideas to bypass the *short-term* memory limitation during Retrieval
   - ☐ Meaning: integrating new memory into prior knowledge or experiences
   - ☐ Emotions: distinctiveness and emotions or senses wrapped in a story format
2. Storage:
   - ☐ Spaced Repetition: repeating testing of memories in progressively larger intervals with greater long-term memory retained
   - ☐ Interleaving: separating the testing of particular types of memories
   - ☐ Consolidation: good sleep enables retention for all memories [5]
3. Retrieval:
   - ☐ Active Recall: thinking of a memory without external prompting [6]

- [ ] Self-Explanation: explaining or teaching or retelling a semantic concept to oneself explicitly or to someone else

Process of memory is typically divided into 3 stages [7,8]. Encoding with emotions is best for remembering episodic and sensory memories and chunking for semantic. Most of the techniques of spaced repetition, interleaving, active recall and self-explanation are based on standardised testing which is for semantic memory testing [4].

BUILDING BLOCKS: **Memories** themselves + the **Memory Type**.

> Memories are generally good to have – the more the merrier with exception to false memories. By having not only more, but better-defined memories (integrated with sensory memory, visualisations, meaningful chunks and networks), they can be creatively implemented into one's everyday thinking.
>
> The next section on knowledge details a certain kind of memory.

Knowledge: recognisable as long-term semantic memory, highly related to crystallised intelligence and different from wisdom, which is more an intuitive synthesis and judgment of applying knowledge [9].

Knowledge Types:

- ❖ Natural Science: factual, objective laws and observations based on math, chemistry, physics, biology, environment, engineering and technology
- ❖ Social Science: contextual, social observations based on psychology, linguistics, sociology, anthropology, politics, economics, law and business
- ❖ Humanities/Arts: subjective, experiential stories and creative outputs based in history, geography, philosophy and art mediums (visual, music, film, fashion, architecture, etc.)

Knowledge Levels:

1. **K1**. Domain: perspectives on the structure of all knowledge
2. **K2**. Topic: recognition of high-level topics and their main themes

K3. Subtopic: differentiating nuance between large thematic topics on different levels
K4. Model: a system of ideas interacting under a theme of a subtopic
K5. Concept/Schema: a small chunk of interacting ideas
K6. Ideas/Variation: an idea with variational nuance in different situations
K7. Details: specific examples or instances of the idea

K1 Social Science **K2** Linguistics **K3** Semantics **K4** Synonyms **K5** Valence Synonyms **K6** Valence Synonyms in English **K7** Valence Synonyms for the English Word 'Happy'

K1 Natural **K2** Biology **K3** Medicine/Anatomy **K4** Central Nervous System **K5** Outer Cortex **K6** Frontal Lobe Damage Effects **K7** Memory Issues upon Frontal Concussions in Sports

Experts appear to simply hold more prior knowledge than the novice [10], and thus be able to chunk levels of knowledge with greater effectiveness and efficiency.

Example Distinctions:

- ➢ Names of peers at a local 9PM community art class in a suburb in NSW Australia
- ➢ Reasons for the Ottoman successfully capturing Constantinople in the 14th Century
- ➢ General guidelines for a good prank
- ➢ How to ride a bike
- ➢ Psychological effect of reminiscing about a mother's home-cooked meal (**K7:** from Social-Psych-Cognitive-Memory-Sensory-Olfactory-Nostalgia)

Distinguishing between the levels and overall topic of any unit of knowledge not just to understand how any piece eventually relates to one's own knowledge base (by moving laterally across topics and vertically across levels), but also as an implicit encoding tool by automatically chunking information for *short-term memory* [11].

BUILDING BLOCKS: **Every piece** of **knowledge.**

> That is, all knowledge that is chunked as part of an interconnected system allows for creative improvisation! Between balancing to not over-extrapolate and to carefully select how certain knowledge fits in topics that first appear wholly different.

For example: Art elements (**K4:** line, shape, form, composition, colour) as fundamental principles can be applied to all art mediums (**K3:** film, sculpture, fashion, graphics, design, interiors) within the domain of the Arts.

SOCIAL: Personality & Emotion

Personality Traits [12]**:**

- Openness to Experience: novelty, imagination, creativity
  - Openness: curiosity, imagination, creative preference to try new things
  - Intellect: creative tendency towards ideas, reasoning and problems
- Conscientiousness: discipline, organisation, achievement
  - Industriousness: tendency to work hard with diligence and diligence
  - Orderliness: preference for organisation, structure and routine
- Extraversion: sociability, outgoing, energetic
  - Enthusiasm: social gregariousness and enjoyment in sociability
  - Assertiveness: confident engagement, leadership in social situations
- Agreeableness: cooperative, trusting, friendly
  - Politeness: prioritising group or cultural norms and respectful harmony
  - Compassion: sensitivity to others with empathetic behaviour
- Neuroticism: negative emotion, stability
  - Volatility: capacity to change emotional affect quickly
  - Withdrawal: tendency for avoidance and sensitivity to negative emotion
- Dark Tetrad: negative traits [13]
  - **Narcissism**: self-aggrandising, ego-driven self-centeredness
  - **Machiavellianism**: manipulating others for personal gain
  - **Psychopathy**: lack of empathy and willingness to use others as instruments
  - **Sadism**: positive emotion from the suffering of others
- Honesty: truth-giving – lack of honesty is highly related to dark tetrad traits [14]

The most scientifically validated model is the Big 5/5 Factor traits with the abbreviation ‘OCEAN’ split into 10 aspects, alongside dark tetrad traits. An individual’s personality is

made up of a mixture of these traits, which remain relatively stable over the lifetime [15]. Such profiles in a population can derive insights such as the link between academic performance and Agreeableness, Conscientiousness, and Openness. [16]

Example Distinctions:

- ➢ Enjoys meeting new people daily and empathising with their lives
- ➢ Fact-checks historic events and sends polite emails correcting others
- ➢ Enjoys conflict and causing drama when life is too peaceful
- ➢ Feels overly nervous and overwhelmed when trying new roles for work (CI-NW)
- ➢ Devises new recipes every week with an excel spreadsheet

For self-awareness, understanding personality traits allows the orientation of one's lifestyle towards and/or away from their own strengths and comforts. For the nervous work roles example, this may represent an industrious disposition with excess neuroticism (CI-NW), so they may also conscientiously alter their self-talk to be more positive and in the meantime, to focus on work over one's internal negativity when possible.

BUILDING BLOCKS: Personality traits + trait profiles.

> One can develop an eye for certain personality trait profiles in others as a combination of traits in the individual. Over time, one can grow to predict behaviour and gauge the group dynamics of interacting personality profiles – what one does with this information is up to the individual...and their personality.
>
> A special note about Openness, which generally allows greater states of **play**, enabling the creative combination of building blocks, with established procedures.
>
> For example, you might find that a collection of individuals high in trait extraversion, industriousness and openness with some level of **narcissism** and **machiavellianism** leads to a good establishment of a startup, but then requires a balance of compassionate and honest individuals to maintain a good startup culture.

Emotion: the combination of feeling, action and appraisal; can be conceptualised as the short-term outlook of a long-term personality profile, as weather is to climate [17].

Emotion Types:

- ❖ Discrete Emotions (SADFiSH) [18]:
  - ➢ Sadness: melancholy, sorrow, grief
  - ➢ Anger: hostility, aggression, frustration
  - ➢ Disgust: distaste, aversion, hatred
  - ➢ Fear: anxiety, dread, terror
  - ➢ Surprise: awe, shock, amazement
  - ➢ Happiness: joy, enthusiasm, contentment
- ❖ Dimensional (Valence, *Arousal*): based on a spectrum of 2 axes [19]
  - ➢ Positive Arousal: happiness, surprise, curiosity, playfulness
  - ➢ Negative Arousal: fear, disgust, anger, jealousy
  - ➢ Positive Non-arousal: hope, satisfaction, love, warmth
  - ➢ Negative Non-arousal: irritability, sadness, loneliness, apathy
  - ➢ Neutral: boredom, calm, focus, indifference

As emotion is a subjective experience, scientists have had difficulty arriving at a consensus for a theory of emotion. However, there does appear some convergence of agreement with certain emotions, but less so for their physiological causes [20]. Personality is strongly linked to emotions, particularly Extraversion and Neuroticism [17].

Example Distinctions:

- ➢ Feeling vibrant and energised meeting new people
- ➢ Cautiously interjecting a conversation with a fact correction
- ➢ Trepidation and a hint of tearful frustration towards injustices
- ➢ Nervousness trying to achieve a standard while not falling off a bike
- ➢ Amused satisfaction after creative struggle (SH:V+*A*=)

Start off with identifying emotions, then mapping out the trajectory of their changes in response to the environment. For the amused satisfaction example, one may identify elements of Surprise and Happiness, marked by a positively *neutral arousal* state.

Emotion Applications:

- ☐ Emotional **Expression**: external communication of emotions as in facial expressions, body language balancing authenticity, communication and sociality
- ☐ Emotional *Regulation*: adjusting emotional expression and intensity based on context [21]
- ☐ Emotional Awareness: recognising emotions and making decisions from a regulated consideration for feelings

BUILDING BLOCKS: Emotions + Emotional Expressions

> Emotions, once recognised, can be tracked with greater awareness in the self to self-regulate one's emotions, and in reading the emotional profile of others in the form of empathy. From empathy, one may interact *considering others'* emotions, connect on a deeper level with shared **expressional communication**, and even craft emotional experiences for others.
>
> For example, in writing an emotional profile of a narrative arc: firstly one may introduce a hook that instills shock and apprehension, to be explained and built up with negatively *low arousal* forms of sorrow and frustration, which is finally resolved in positively mixed *high and low arousal* states of awe, joy and satisfaction.

SENSE: Attention & Perception

Attention Types [22]**:**

- ❖ Executive: self-regulatory monitoring and management of attentional processes
- ❖ Selective: directed orientation by selecting relevant stimuli
- ❖ Sustained: state of vigilance and maintained sensitivity and arousal state
- ❖ Divided: processing multiple sources of information simultaneously
- ❖ External or Internal Attention [23]:
  - ➢ External: category relating to spatial, temporal or sensory attention

- *Internal*: category relating to tasks, responses, long-term or *working memory*

This represents varying models of attention in the literature, some of which can be linked with biological and neural mechanisms [22,24] – but generally, external or *internal* attention can be used as properties to the other 3 types.

Example Distinctions:

- Keeping track of all a room full of attendees during an event
- Recalling a niche fact about the Byzantine Empire
- Regulating feelings of anger while speaking calmly
- Instructing a group of coworkers while riding a bike across the city (*I*:E-E:SD)
- Focusing on cooking

In the bike riding example, there may be *internal* executive management of memory about the instructions to give, while external attention is sustained over the bike ride, however divided between riding the bike and communicating with the coworkers.

BUILDING BLOCKS: Attention Types

> As established, *working memory* is limited to about 7 objects [1] which governs attention. By paying attention to our own attention with mindfulness [25], and empathising with others' patterns of attention, external and internal priorities can be directed and harnessed with intention.
>
> For example, knowing that instances of selective and divided attention seem to differ in the wellbeing and productivity between two individuals, a head chef can cater tasks to them, such as a prep chef focusing on ingredient preparation and a line cook juggling several dishes.

Perception: can be conceptualised as sensory *internal attention* and are associated with biological sensory receptors in the body [26].

Perception Types [27]**:**

- ❖ Visual: based on field of vision
- ❖ Auditory: the sounds able to be heard
- ❖ Gustatory: taste-based, for food
- ❖ Olfactory: smell, based on receptivity to volatile chemical compounds
- ❖ Tactile: touch-based, somatic and coordination
- ❖ Other: Proprioception, Vestibular, Chronoception, Nociception, Thermoception – to do with body sense, spatial and balance, time, pain, heat

The most basic model of perception is the 5 senses. This can be extended considering all the other types of receptors with some examples above. It should be noted that visual perception remains one of the most significant senses in everyday life and in research [28].

Example Distinctions:

- ➢ Fully taking in someone's presence from a hug
- ➢ Recalling a fully sensory memory from the past
- ➢ Navigating dense woods at night by orienting towards a river
- ➢ Struggling to ride a bike on a highway
- ➢ Cooking, taste-testing and presenting a dish (VGO-T)

Most senses are usually engaged in any act, but the degree as well as the selective attention applied to each varies moment to moment [29]. In the cooking example, discerning the tastes in a dish requires executive control to focus on and give selective external attention to the aroma and taste combining gustatory, olfactory and possibly temperature perception – and although taste-based, still requires visual input for presentation.

BUILDING BLOCKS: Senses + Sense types

> Sense perception can be refined and combined into multisensory experiences either in art or experience.
>
> Most sensory perceptions have correlations in a creative medium, such as the visual arts, music, culinary arts and sports, which in turn contain pathways for refining sensory usage either in reception or creation. For example, interval training

for auditory perception, which then allows an easier time learning, playing and improvising music by ear.

MIND: Metacognition

Metacognition is the master key behind unlocking cognition, as in the information and strategies supplied in this developmental guide. It acts as the underlying and explicit process responsible for continued development of cognition as is one of the primary goals of the agentic, lifelong learner.

Metacognition Types [30]**:**

- ❖ Metacognitive Knowledge [31]:
  - ➢ Declarative: what cognitive strategies exist
  - ➢ Procedural: how cognitive strategies are used
  - ➢ Conditional: when and why to use certain strategies
- ❖ *Metacognitive Regulation:*
  - ➢ Monitoring: assessing thinking during thinking in progress
  - ➢ Control: evaluation and planning before and after thinking

Metacognitive awareness can be described as thinking about thinking [32], or the skill of integrated metacognitive knowledge and *regulation*, which is increasingly being recognised as an essential educational and life skill [30].

Example Distinctions:

- ➢ Connecting a name to a facial feature to remember people by
- ➢ Reminding oneself to be more tactful in casual conversation
- ➢ Signing up an introvert acquaintance for a public speaking event in 2 weeks
- ➢ The state of psychological flow when bike riding
- ➢ Adapting a sauce during taste-testing with taste interaction knowledge (KDP-RM)

In all cases, declarative metacognitive knowledge must be invoked. For the sauce taste example, considering the perception-based knowledge of taste interactions, the sauce is

said to be adapted procedurally – perhaps by balancing sweetness with a bit of sourness from a lemon – and this is all done in the moment by continually monitoring the taste.

BUILDING BLOCKS: Metacognitive knowledge + regulation

> Declarative metacognitive knowledge underlies every other cognitive concept, as in perception, attention, motivation, etc. and this easily extends into how, when and why such cognitive strategies are used procedurally and conditionally. For example, the concept of 7 objects in *working memory* [1] has defined the structure of this guide and the taxonomy of concepts presented that are easily chunked.
>
> Any cognitive process can be *metacognitively regulated* by monitoring during, or controlling before and after.

APPENDIX

Advanced Concepts:

1. Knowledge & Memory: false memories, cognitive load theory, interdisciplines
2. Personality & Emotion: attachment, temperament, intuition
3. Attention & Perception: synesthesia, aphantasia, multisensory integration, interoception
4. Metacognition: attitudes, stereotypes, scripts, conspiracies, bias, self-talk

Analysis of examples not provided in the main body to encourage active reading and problem solving.

Memory Examples:

- Remembering someone's name after just meeting them for reference (*S-T*: S+P)
- Recalling a historical fact related to a building one is currently in (L-T: S)
- Updating a friend about what you did this morning (*S-T*: E)
- Riding a bike after five years of not riding one (L-T: P+S)
- Recalling a childhood memory about a mother's home-cooked meal (L-T: E+S)

Knowledge Examples:

- Names of peers at a local 9PM community art class in a suburb in NSW Australia (Arts-Visual-Painting-Community-Suburb-Class-**K7**)
- Reasons for the Ottoman successfully capturing Constantinople in the 14th Century (Humanities-History-Medieval-Ottomans-Constantinople-**K6**)
- General guidelines for a good prank (Social-Society-Comedy-Pranks-**K5**)
- Engineering design of a bike (Natural-Engineer-Transport-Land Vehicles-Bikes-**K6**)

- Psychological effect of reminiscing about a mother's home-cooked meal (Social-Psych-Cognitive-Memory-Sensory-Olfactory-**K7**)

Personality Examples (when done regularly and consistently for a long time):

- Enjoys meeting new people daily and empathising with their lives (EE-AC)
- Fact-checks historic events and sends polite emails correcting others (OI-C-AP-N)
- Enjoys conflict and causing drama when life is too peaceful (A‾-NV-**S**)
- Feels overly nervous and overwhelmed when trying new roles for work (CI-NW)
- Devises new recipes every week with an excel spreadsheet (O-CO)

Emotion Examples:

- Feeling vibrant and energised meeting new people (SH:V+*A+*)
- Cautiously interjecting a conversation with a fact correction (F:V=*A=*)
- Trepidation and a hint of tearful frustration towards injustices (SAD:V-*A-*)
- Nervousness trying to achieve a standard while not falling off a bike (FS:V=*A=*)
- Amused satisfaction after creative struggle (SH:V+*A=*)

Attention Examples:

- Keeping track of all a room full of attendees during an event (E:SD)
- Recalling a niche fact about the Byzantine Empire (*I*:ES)
- Regulating feelings of anger while speaking calmly (*I*:E-E:S)
- Instructing a group of coworkers while riding a bike across the city (*I*:E-E:SD)
- Focusing on cooking (E:ES)

Perception Examples:

- Fully taking in someone's presence from a hug (VAOT-PT)
- Recalling a fully sensory memory from the past (VAO-C)
- Navigating dense woods at night by orienting towards a river (AOT-PVCN)
- Struggling to ride a bike on a highway (VAT-PV)
- Cooking, taste-testing and presenting a dish (VGO-T)

Metacognition Examples:

- Connecting a name to a facial feature to remember people by (KDP-RM)
- Reminding oneself to be more tactful in casual conversation (KDC-RC)
- Signing up an introvert acquaintance for a public speaking event in 2 weeks (KDPC)
- The state of psychological flow when bike riding (KD)
- Adapting a sauce during taste-testing with taste interaction knowledge (KDP-RM)

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FAQS

Q: What are ‘building blocks’?
A: ‘Building blocks’ are a metaphor for very simple concepts presented in the guide that are likely to remain continually relevant for a long time and have creative potential to be stacked up and assembled in many innovative ways. They are for the individual to refine their own practices, to experiment with and come up with new solutions and techniques.

Q: Is this guide scientific / evidence-based?
A: Yes - references are listed at the end of the guide. Although much of the science especially concerning emotion and intuition is fairly debated and psychology does not exactly have the highest reputation for replication, this guide is based on a fair amount of evidence that is currently available as of early 2025. I, the writer of this guide, do not have a formal psychology credential, but have engaged in at least a bachelor’s degree worth of self-learning under my own terms, and I hope the reader can simply attest to the scholarship applied.

Q: Did you generate this?
A: I am happy to report that I wrote this guide with my own two hands, a keyboard or two and some voice dictation, except for the references. No part of this guide was AI-generated, although I am a generative-AI enjoyer – particularly when it comes to serving up research summaries and answering general questions that are difficult to web-search. Hopefully that gives you some solace in a world becoming increasingly non-human.

Q: Who made this guide?
A: I’m Angus, a multidisciplinarian with a paradoxical specialisation in all things systems thinking, holistic integration and cross-domain strategy. I help people with complex projects and interests address their root problems by big-picture meta-thinking and application of idiosyncratic frameworks I've developed as initial personal experiments (just like this one!).

Q: Will you do more with this?
A: Yes. This cognitive-based guide is currently serving as a starting template as part of a larger and longer ambition for establishing a similar guide but on a more holistic scale centered around healthy individuals and groups. Additionally, I do hope to extend this series with a more actionable/techniques-based side.